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President's Address.

HOSPITAL PROBLEMS.¹

By SIR JAMES BARRETT,

President of the British Medical Association.

THE late Sir Richard Stawell would have given a characteristic address on this unique occasion, a monument of industry and penetrating thought. Had it been possible to ascertain what subject in the vast range of the science of medicine he had selected, it would have been my privilege to have followed the lead he had given. But as there is, I regret to say, no indication obtainable, it only remains for me to deal with the subject with which I am daily engaged and best described as "Hospital Problems", though it would really be more accurately described as "Studies in Human Nature". It is owing to the absence of consideration of this factor that many failures occur. The failures are sometimes surprising and remarkable.

¹ Read at the annual meeting of the British Medical Association, Melbourne, September, 1935.

I propose, with as much brevity as may be possible, to indicate the various phases of the hospital problem which have forced themselves under my notice during a lifetime spent in hospital work.

Prior to the War I had been an assistant surgeon to one ophthalmic hospital in London and clinical assistant to another, and also a surgeon on the staff of the Eye and Ear Hospital, Melbourne, and ophthalmologist to the Melbourne Hospital, and occupied similar posts in several ophthalmic organizations in Victoria. I knew, of course, what I wanted for my work, and as a member of the Committee of Management of the Eye and Ear Hospital I had some knowledge of administration. But when the War broke out and I reached Egypt in January, 1915, in a short time I found myself actively concerned with

the administration of a thousand-bed hospital, and soon after in general supervision of hospitals containing about eleven thousand beds, and also of a fleet of ambulances. All sorts of problems of which I was ignorant made their appearance, and a process of forced education was imposed on me.

On return to Australia in 1919, where I again took up the work of the Victorian Bush Nursing Association (initiated in February, 1911, and of which I have been honorary secretary from its inception) and ordinary hospital work, my attitude was naturally modified by the experience gained in strenuous circumstances when serving in the Australian Army Medical Corps to February, 1916, and in the Royal Army Medical Corps thereafter to the end of the War.

I propose today to deal with six related problems: (i) The Victorian Bush Nursing Association, (ii) the hospital system of Victoria, (iii) the hospital system of Great Britain, (iv) the hospital system of New Zealand, (v) the most suitable size of a hospital, (vi) the nature of the nursing services in hospitals.

May I, however, again, at the outset, indicate that I should have preferred to call this address a study in human nature, for that is the all-important factor which is usually overlooked in these varied systems. The Latin poet reminded us that if we chase nature away with a pitchfork she always comes home again, and I think the late Professor Huxley also indicated another essential feature of social life. If one attempts to alter social arrangements two results are certain. When the effort has been made we will not be in the position we occupied, nor shall we obtain exactly the result we expected; human nature asserts itself. With these elementary facts in mind let us turn to the practical issues.

The Victorian Bush Nursing Association.

Owing to the initiative of the Countess of Dudley, wife of the then Governor-General of Australia, and Sir Thomas Gibson (afterwards Lord) Carmichael, Governor of Victoria, and Lady Carmichael, in the year 1911 one trained nurse was established with much difficulty at Beech Forest, the residents undertaking to pay her salary. In two years' time thirteen such nurses had been established, and many troubles became apparent. At first the salary was raised by subscription and the varying amounts contributed by residents caused criticism and feeling. The centres ended this conflict by making the contribution uniform and by determining that those who paid were entitled to the nurse's services without charge—a decision which led to a remarkable result, though not foreseen at the time.

Next came the problem of housing. Hotels, boarding houses and private houses interfered with the privacy of the patients, and both patients and nurses preferred small cottages which were rented. In the natural course of events some of these cottages developed into hospitals.

Visiting thirteen centres in remote places to ascertain how they were developing became impossible as an honorary service, and a superintendent was appointed with the aid of the Walter and Eliza Hall Trust. Unless someone visited the centres and ascertained how they were developing, the system would soon become unworkable.

The movement developed until in 1921 there were thirty-three centres. Then one small cottage hospital was established by the State Rivers and Water Commission, followed by another established as a soldiers' memorial, and a third, in 1923, at Phillip Island—a gift from two generous citizens. The hospital created by the Commission was adjoining a large camp, really a town, developed by the building of a large dam on the Goulburn River. So it came about that in 1925 there were forty-four purely nursing centres and three hospitals.

The appearance of the hospitals was followed by the transference to the hospitals of the contributory scheme applied to purely nursing centres, with the arrangement that those who contributed could obtain unlimited hospital and nursing attention for themselves and dependants up to a certain age at the cost of approximately two guineas per week. But all patients are required to make their own arrangements with their medical attendant, a system which, being essentially human, has worked exceedingly well. Throughout, the nurses give service in the adjacent schools.

In 1926 the Edward Wilson (*The Argus*) Trust decided to establish an ambulance service throughout the State on the same basis as the bush nursing movement, namely that the ambulance service, apart from the initial gift, must be self supporting. Table I indicates the subsequent growth of these movements.

TABLE I.
Indicating the History of the Victorian Bush Nursing Association.

Date.	Number of Centres.	Number of Hospitals Built and Building.	Number of Ambulances.	Administration.
1910				Founded by the Countess of Dudley with the support of Lord and Lady Carmichael.
1911	4			First Superintendent appointed (Miss E. M. Greer).
1913	13			
1914	20			
1915	21			
1916	24			
1917 to 1920	28			
1921	33	1		Miss E. M. Greer resigned. Miss E. C. Cameron, A.R.R.C., appointed.
1922	39	2		Miss M. Mathieson appointed as assistant.
1923	47	3		
			Country Ambulance founded	
1924	47	3	6	Miss E. C. Cameron resigned. Miss M. L. Gillis appointed.
1925	47	3	11	
1926	52	8	18	
1927	55	9	19	Miss M. L. Gillis resigned. Reorganisation of administration; office of Superintendent abolished. Office and Nursing Supervisor and a travelling Inspector appointed, owing to magnitude of work. Miss M. Mathieson, Office and Nursing Supervisor; Miss M. Edwards, Travelling Inspector.
1928	59	14	21	
1929	62	17	21	
June, 1930	68	25	22	There are 24 purely nursing centres.
June, 1931	66	28	22	
1932	63	29	21	
1933	68	38	21	
1934	67	40	21	
1935	69	45	22	

A survey of the State was made in 1924, and thirty-one ambulances were estimated as the requisite number to serve the country. Sixty-eight first-aid outfits were also provided by the Edward Wilson (*The Argus*) Trust for remote places where wheeled

in the State, provide the cheapest hospital accommodation in the State. Of the quality of the service you can judge for yourselves.

The hospitals are, in addition to their usual functions, health centres for school work and baby



Korumburra (Victoria) Bush Nursing Hospital.

vehicles might not be easily employed. This ambulance development owes much to the initiative of the Countess of Stradbroke, wife of the then Governor of Victoria. As far as the hospitals are concerned they receive and request nothing from the

health centres. The illustrations show the type of building and the accommodation afforded at what, so far as I can learn, are the lowest rates in the world. But it must be remembered that the success of these forty-five hospitals, with an aggregate accommodation



Euroa Bush Nursing Hospital Theatre.

Government for construction, and, except in six instances of special and really historical interest, nothing for maintenance. They must maintain themselves or close. So far none have closed, and the present position is that these hospitals, staffed by doubly and trebly certificated nurses, and not by trainees, by nurses who are the best paid nurses



Yarra Junction Bush Nursing Hospital. (One bed ward.)

of about four hundred and sixteen beds, depends on the fact that the contributory system invented by the purely nursing centres was naturally transferred to the hospitals when they came into existence.

The cost of construction, but not of maintenance, has been borne by the Edward Wilson (*The Argus*) Trust and the H. V. McKay Trust to the extent of

one-sixth to one-third of the cost. The balance has been provided by the districts which own them. The cost of the economical administrative central service has been borne by the following Trusts, namely the Walter and Eliza Hall Trust, the Edward Wilson (The Argus) Trust, the David Syme Charitable Trust, the Felton and Sumner Trusts, the H. V. McKay Trust, the Henry Gyles Turner Samaritan Fund, the L. Henty Estate, the J. R. McPherson Fund, the Joseph Kronheimer's Estate, the Alfred Edments Trust, and the Mrs. C. H. Opie Estate.

To such a gathering it is unnecessary to indicate the great improvement in medical practice which has resulted from the provision of suitable buildings and very highly trained nurses in country districts.

The bush nursing principle consists in the clear recognition of the fact that in private and intermediate hospitals, and to some extent in public hospitals, the sick and injured must defray the cost of their treatment. The sick and injured in these institutions do not come into the picture until they are sick or injured. In the bush nursing system so many people pay, say, thirty shillings a year. As only a percentage require the hospital, the fees can be lowered by the utilization of this basic income for hospital purposes.

A factor which has profoundly influenced the development of the bush nursing hospitals is the rule that the medical practitioners who treat patients in these hospitals become *ex officio* members of the committee of management. This system has worked smoothly and efficiently. It is obvious that the Association is really a hospital insurance system.

The Victorian Public Hospitals.

If we turn now to the system of public hospitals in Melbourne and in Victoria there is much to be learnt from the foregoing. The public hospitals are maintained by voluntary contributions, by Government subsidy and by patients' contributions, but are not under direct Government control, being administered by honorary committees containing many eminent citizens. They are theoretically existent for the benefit of the sick and injured poor. Between these institutions and the expensive private hospitals there are a number of intermediate hospitals, mostly organized by religious bodies at which the charges, though in my opinion too high, are less than

those of the private hospitals. Of the taxpayers in Victoria 85.6% receive £300 *per annum* or less, and 14.4% receive more than £300. It is obvious that the hospital problem resolves itself into making proper provision for many of the 85.6% by giving them the necessary hospital and nursing attention at rates within their means. Up to about the year 1900 the public hospital system worked tolerably well, but since then a great change has taken place as the following tables indicate.

In 1900 the contributions (in round figures) from the public amounted to £101,500, and from the Government and municipalities £66,500, making a total of £168,000. But in 1934 the contributions from the public were £451,500 and from Government and municipalities £254,000, making a total of £705,500. But the population had increased only by 53.6%. The details are set out in Table II.

But in the meantime patients in public hospitals increased to an extraordinary extent, as Table III indicates.

TABLE III.

Comparative Statement of Public Hospital Out-patients and In-patients for the Years 1900, 1914, 1924, 1934.

Group.	1900.	1914.	1924.	1934.
Out-patients:				
Melbourne ..	46,665	69,450	103,760	213,098
Country ¹ ..	15,235	8,525	25,894	25,135
In-patients:				
Melbourne ..	11,432	20,745	28,279	48,611
Country ..	13,086	12,889	16,495	34,413

¹ Includes country benevolent cases.

But hospital expenditure had increased enormously, as Table IV indicates.

TABLE IV.

Comparative Statement of Public Hospital Expenditure on Maintenance Account for the Years 1900, 1914, 1924 and 1934.

Group.	1900.	1914.	1924.	1934.
Melbourne ..	£ 75,211	£ 116,442	£ 303,149	£ 432,767
Country ..	59,682	71,863	138,216	192,448
Total ..	£134,893	£188,305	£441,365	£625,215

When the public hospital position in the State of Victoria in 1900 is compared with that of 1934,

TABLE II.

Comparative Statement of Public Hospital Income for Maintenance Purposes for the Years 1900, 1914, 1924, 1934 (in round figures).

Year and Group.	Government Grant.	Municipal Grant.	Charitable Contributions.	Patients' Contributions.	Other Sources.	Total.	Grand Total.
1900—							
Melbourne ..	£ 24,000	£ 2,000	£ 35,500	£ 9,000	£ 25,000 ¹	£ 95,500	£
Country ..	31,500 ¹	9,000	24,000	8,000		72,500	168,000
1914—							
Melbourne ..	29,500	3,500	36,000	21,500	27,000	117,500	
Country ..	20,000	4,500	23,500	8,000	11,000	67,000	184,500
1924—							
Melbourne ..	56,000	6,000	97,000	67,500	107,000	333,500	
Country ..	24,500	7,000	53,000	31,000	23,000	138,500	472,000
1934—							
Melbourne ..	161,500	8,500	90,500	106,000	134,000	500,500	
Country ..	54,500	29,500	48,000	53,000	25,000	205,000	705,500

¹ Includes country benevolent cases.

² Amounts not separately shown for metropolis and country.

we find that the population has increased by 53.6%. The number of in-patients has increased by 238.6%, and the number of out-patients has increased by 284.9%.

In 1900 the number of persons treated at public hospitals was 7.2% of the population. In 1934 the number of persons treated at public hospitals was 17.4% of the population. This is now presented in the form of a graph.

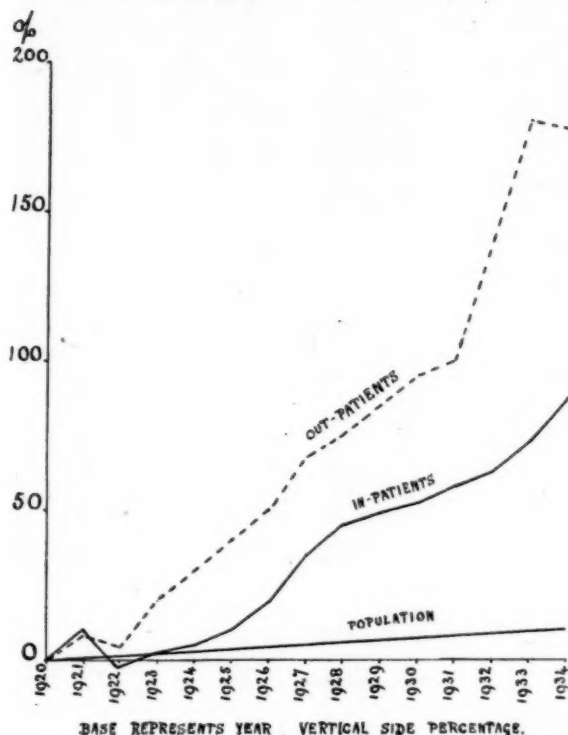


TABLE V.

Contributing Sources per centum to Public Hospital Revenue for Maintenance Purposes in Victoria for the Years 1900 and 1934.

Source.	1900.	1934.
Charitable contributions	35.6	18.9
Patients' contributions	10.2	22.6
Government grant	33.3	30.6
Municipal grant	6.5	5.4
Other sources (legacies, endowments <i>et cetera</i>)	14.4	22.5

If a shorter period is taken, from 1920 to 1934, the change is even more marked, as the following figures show. In the fourteen years 1920 to 1934 the population of the State has increased by 20.3%, whereas the number of public hospital in-patients has increased by 86.5% and the number of public hospital out-patients has increased by 176.7%.

In 1920 the proportion of public hospital patients to population was 8.5%. In 1934 the proportion of public hospital patients to population had increased to 17.4%.

But people can find money to spend in other things. In 1929-1930 the expenditure in Victoria on tobacco

was £4,926,800, or £2 15s. 5d. per head. In 1931-1932 the expenditure in Victoria on tobacco was £3,922,962, or £2 3s. 6d. per head. In 1930-1931 the expenditure in Victoria on beer was £7,441,200, or £4 3s. 1d. per head. The cost of the public hospitals is less than eight shillings per head.

From these facts definite conclusions can be drawn. The hospital problem is, in Victoria, essentially a city problem. In the country the change has been much less pronounced. But we have people who advocate the cessation of the charitable system and who would throw the burden on to rates and taxes, as New Zealand did, and they must be made to face the basic facts.

The contribution from patients and public amount to £450,000, that is 66% of the income, or if you deduct patients' payments, about £340,000. This would certainly disappear almost completely when the change was made, and the patients' payments might also decrease substantially. The New Zealand figures are eloquent, as you will see directly. There is no mistake about the forecast. If people are taxed for hospital purposes, why should they make voluntary contributions? Why should they pay when they enter a public hospital for which they are in many cases already taxed? Thus before the hospitals benefited between £350,000 and £400,000 would have to be provided by taxation to make good the deficiency caused by the certain loss of voluntary gifts. The public cannot have the advantages of both systems. They must choose the one or the other.

Summarizing, then, the sole cause of the hospital problem is not want of money, but simply that tens of thousands of people now resort to the public hospitals who did not do so formerly. A great change of attitude has taken place, and with that we must alter our ideas and outlook and meet the difficulties arising from the change.

The enormous increase in the demands on the public hospitals of Victoria is not materially due to the depression. You will note that the change has been continuous since 1900.

As regards the increasing cost of hospitals, some qualifications are necessary: (i) The value of money has diminished, though that is less marked in its internal than in its external purchasing power. (ii) The rates of payment of the paid non-medical staffs have increased. (iii) X ray plants and various pathological services add to the cost, though not to the extent usually imagined. But after making due allowance for these factors, it is obvious that in serious illness some hospital service is now required by the public, I think rightly, whereas formerly people were treated in their own homes. But it is also obvious that this does not explain the enormous growth of the out-patients' service, even if we allow for some duplication. Is it not a little remarkable that in calculating the basic wage in Victoria nothing is allowed for medical expenses? Ninepence a week, that is about £2 a year, would make all the difference if the money were so applied. But this profound change in attitude has been accompanied by the tacit assumption that medical experts will continue to give honorary service just as if they were officers of a charitable institution.

The English System.

Of the English hospital and medical system in general I have nowadays no direct knowledge such as that possessed by many members of this audience. But I shall quote from an address given by Sir Basil Blackett, who is a director of the Bank of England, and who spoke with great breadth and insight on July 5, 1932, in a lecture entitled "A Layman's Plea for a Positive Health Policy". Realizing as many people do that there is a danger of all State social services breaking down by their own weight, he put the questions: "What do health services cost?" "Is the nation getting full value for them?" Table VI shows the estimate of cost, which the compiler thinks is a large understatement.

TABLE VI.

Group.	Treatment of Disease.	Prevention of Disease.	Other Health Services and Expenses Incidental to the Cost of Disease.	Total
	£	£	£	£
Local authorities	21,464,653	23,910,370	29,840,107	80,215,130
Central administration (Ministry of Health and Board of Control)	—	—	1,150,000	1,150,000
National health insurance	9,051,500	—	24,687,700	33,739,200
Friendly societies	762,000	—	5,238,000	6,000,000
Workmen's compensation (applicable to England and Wales)	—	—	6,000,000	6,000,000
Voluntary hospitals	8,699,450	—	—	8,699,450
Voluntary societies and institutions	1,641,896	—	4,941,415	6,583,311
Medical schools	—	—	400,000	400,000
Private practice of Medicine, dentists, drugs and appliances and subordinate medical service	53,000,000	—	—	53,000,000
Total ..	94,619,499	23,910,370	72,257,222	195,787,091
	48%	15%	37%	100%

The cost of poor relief is not included above. The sum involved is £27,889,049.

Expenditure on health services, met by public funds, increased from 1900-1901 to 1927-1928 by 360% or *per capita* 279%, that is, from 14s. 5d. to £2 14s. 9d. per head. The proportion of total national expenditure on health spent directly on prevention in 1927-1928 was only 15%. Has the health of the nation improved by 279%? Discounting the increased expenditure owing to the altered value of money, Blackett has no difficulty in showing that a claim to health improvement of 279% is out of the question. He proceeds to point out that the steady rise in the numbers of in-patients and out-patients at the voluntary hospitals (or as we call them in Victoria, public hospitals) and the habit of sending panel patients to the out-patient departments have become a serious problem. It would almost seem that an expenditure of some £39,000,000 a year on health insurance has proved merely a means by which both sickness and payments for it have increased in volume.

Blackett makes allusion to the insufficiency in many cases of scientific domiciliary treatment. He discusses, but with sympathy, the fact that the medical practitioner cannot refuse a certificate under the national insurance scheme for fear that he will lose his livelihood. The applicant says, in effect: "There is a fund, why should I not benefit?" Time does not permit of further examination of this broad visioned and illuminating document. I shall conclude this part of the survey by expressing my opinion of the British Army Medical Service, of which I was a member for three years. I estimated that the work of the service could be roughly apportioned as one-third prevention, one-third treatment (which was admirable) and one-third devoted to finding occupation for the partially disabled, which was part of my occupation towards the end of the War. In civil life, as there cannot be army discipline, such results can be obtained only by popular education and voluntary action. With one observation of Sir Basil Blackett I am in complete accord. If we can offer the average working man a service within his possible means, he will pay for it. The Bush Nursing Association has taught me that the spirit of independence is still part of the life of the country dweller if this condition is complied with.

The New Zealand System.

If we turn now to New Zealand, we find a system which has been definitely nationalized since 1909. The official figures relating to the working of this system are difficult to disentangle from those of other State charitable enterprises, but have been separated as far as possible owing to the kindness of Dr. Watt, Director-General of Health.

A royal commission on national expenditure was appointed, and reported finally in 1932, and the statements made by that body have not, so far as I am aware, been publicly challenged, though there may be considerable private disagreement. At all events the Government has not accepted many of the recommendations.

New Zealand people, like some Victorians, thought it better to nationalize the hospital service, and did so in 1909. The financial responsibility was thrown on to the ratepayer and taxpayer on a definite ratio between them. Anyone could obtain admission to a public hospital, but could not be charged more than £3 3s. a week, and whilst in the cities the honorary system of medical officers was retained, in many places permanent salaried medical officers were appointed. The resultant financial effect may be followed.

TABLE VII.

Hospital Maintenance and Hospital Board Capital Expenditure during the Years Mentioned.

Year.	Number of Institutions.	Average Number of Occupied Beds per diem.	Hospital Maintenance Expenditure.	Capital Expenditure.
			£	£
1909-1910 ..	59	1,749	174,288	58,259
1914-1915 ..	74	2,564	270,179	115,294
1924-1925 ..	105	4,392	855,104	425,066
1933-1934 ..	123	5,370	936,224	48,559

TABLE VIII.
Hospital Receipts.¹

Year.	Hospital Fees Received.	Gifts and Legacies.
	£	£
1909-1910	35,135	20,833
1914-1915	71,701	20,379
1924-1925	250,954	24,181
1933-1934	331,081	13,465

¹ The figures are approximate.TABLE IX.
Cost to Government and Local Authority.¹

Year.	Hospital Maintenance.		Capital.	
	Cost to Government.	Cost to Local Authorities.	Cost to Government.	Cost to Local Authorities.
	£	£	£	£
1909-1910	69,046	49,273	29,129	29,129
1914-1915	94,239	73,860	57,647	57,647
1924-1925	302,075	277,894	212,533	212,533
1933-1934	295,839	295,839	24,429	24,429

¹ The figures are approximate.

A commission was appointed in 1932 to inquire into all national expenditure, including hospitals, and this commission made some definite statements and recommendations concerning the hospitals.

It will be noted that the expenditure on hospital maintenance in New Zealand is even now considerably greater than that of Victoria, which has a much larger population: New Zealand, £935,000; Victoria, £705,000. The population of Victoria is 1,840,000; the population of New Zealand is 1,560,000.

The commission recommended:

1. That for financial reasons, if no other, the hospital system be reorganized.

2. That they could not discover any instances where the full cost of treatment was charged to a patient whatever his circumstances, and consequently the burden on rates and taxes has continued to increase.

3. That reorganization would enable the Governmental subsidy to be reduced by ten shillings in the pound and that the burden on local authorities could be reduced.

Since then considerable economies have been effected. But in 1933-1934 the total voluntary contributions to hospital and other governmental institutions was only £13,500, and the total fees collected amounted to £331,000, whilst the levy on government and local authorities for maintenance still remained as high as £592,000 (that is £296,000 each); and the fees receivable amount to £954,000 (accumulated debt), but apparently cannot be collected.¹ In Victoria the Government contribution is £216,000 and the municipal contribution £38,000.

Into the consideration of the nature of the medical service and the obvious and serious political implications of the administration I am not competent to enter, but the facts warrant the definite conclusions: (i) That nationalization inevitably puts an end practically to charitable contributions. (ii) That the collection of fees payable by those who use the hospitals is extremely difficult in a nationalized

system. (iii) Consequently a nationalized system must be expensive to government and local authorities. Australian taxes are the highest but one in the world, and the foregoing conclusions have a direct bearing on our policy.

Dr. Malcolm McEachern, of the American Medical Association, made an investigation of the New Zealand system in 1927. He is reported to have made the following significant observation:

I hope voluntary effort and voluntary control will never be replaced in New Zealand wholly by governmental or national effort and control, for, if it does, the hospitals of this great dominion will never come into their own under a wholly taxation system. A voluntary-giving people make for better citizenship and tends to keep the hospital human.

Goldwater, the superintendent of that great hospital Mt. Sinai, New York City, and the world's greatest hospital authority, in my opinion, uttered immortal words recently when he said: "The voluntary hospital gifts come as expressions of love, gratitude, friendship, memory, good fellowship, pride of the family, and pride of the race. Under a purely public or state system the hospitals may be able to spend as much money as they are spending today, but the joy of spontaneous giving will be gone. One shudders to think of the day when hospitals, transformed into soulless standardized state institutions, will be compelled to haul down the flag of human brotherhood. May that day be far off, and may American hospitals contrive for generations to be supported by voluntary contributions."

The Size of Hospital.

What is the most desirable size of a hospital? It is evident that a very small hospital cannot provide all the necessary specialized equipment for the treatment of disease, though the staff of one bush nursing hospital of about thirty beds informs me that not more than 4% of the patients require a pathologist or X ray therapeutic equipment. (Many bush nursing hospitals contain an X ray diagnostic plant and have access to a pathologist.) On the other hand a hospital of 4,000 beds, such as the Bellevue in New York is reported to contain, is obviously unwieldy. The Vancouver Hospital, of 1,100 beds, occupies about three city blocks, and the mere effort of transportation from one place to another is severe. The Military Hospital near Honolulu, with only 400 beds, almost requires small motor cars on the corridors. Between the two extremes there must be the most suitable size. The administrative expenses of a hospital are a very small part of the total running cost—about 3% to 5%. But as the hospital grows more nurses and attendants become necessary. Certified engineers are wanted, and so on. At the Royal Melbourne Hospital, with 400 beds, excluding the honorary medical staff, there are 1.1 employees to each bed. At the Alfred Hospital, with 320 beds, there are 1.2 employees to each bed.

The medical superintendents of two Canadian hospitals informed me that in their opinion 300 beds should be the maximum size, and then only with vertical extension of the building and with different floors devoted to special purposes, and self-contained. Some senior American surgeons fixed the limit at 250 beds. By general consent about 500 beds is the extreme outside limit. It would be surely better, where more accommodation is wanted in a fair sized hospital, to cease any effort for extension and to build a new hospital somewhere else.

May I, however, submit a conundrum which I have found it difficult to answer in accurate technical

¹ A correction is requisite. The £954,000 marked fees receivable represents fees earned or debited for the current year, whether paid or not. Thus, of this sum £331,000 was paid, leaving an amount of £623,000 unpaid during that year.

fashion? Today there are built and building 45 bush nursing hospitals. There are 45 kitchens, 45 laundries, 45 staff quarters and 45 reception rooms, 31 properly equipped operating rooms, and 60 bathrooms. If this system, containing in the aggregate 416 beds, were placed in one building, with one kitchen, one laundry, one reception room and one set of staff quarters, with say four operating theatres and ten or more bathrooms, the natural assumption would be that it would be cheaper to build and to administer. The cost of indoor beds in the bush nursing buildings is £400 a bed, or with the veranda beds from £180 to £200 a bed, for superb accommodation which, I think you will agree after inspection, is far superior to anything the public hospitals can provide. Yet as a matter of fact the cost of hospitals in Melbourne has never been less than £600 a bed, and, it is reported, has reached £2,000 a bed. What is it that is wrong with the centralization? And so I finally put the question, if a hospital of 300 to 400 beds is becoming insufficient to meet requirements, why seek to extend it? Why not build another hospital somewhere else?

Nursing Services in Hospitals.

As most of us are aware, in Canada there are at least three types of nurses: (i) The bedside nurse; (ii) the bedside nurse with sufficient pre-graduate or post-graduate training to enable her to become better qualified or become a public health nurse; and (iii) the graduate in science in nursing who, after matriculation, becomes a graduate after a five years' university course.

In Victoria we have bedside nurses who in many cases, especially in bush nursing service, hold a general, an obstetric, and often a baby health certificate, and we have made a sound commencement in developing post-graduate work, largely owing to the energy and leadership of Mrs. Herbert Brookes. But to obtain the three certificates and to follow post-graduate study involve five or six years of work. The question arises whether our administration of public hospitals by trainees and a limited staff of trained nurses is sound in principle or just to the trainees. For example, the Royal Melbourne and the Alfred Hospitals, containing 750 beds, are staffed by 82 sisters and staff nurses and 326 trainees. Should we not train nurses, as we do medical students, and so shorten the length of training? There is no sense, from the educational point of view, of a trainee repeating something she has learned to do efficiently. On the one hand five or six years of preparation and partially paid work should insure an adequate remuneration, on the other it is right that public hospitals should be maintained largely at the expense of the trainees? The financial difficulty is obvious, but sooner or later the issue must be faced. Any change would perforce be gradual.

Conclusion.

Thus the data have been set out in sketch form illustrating (i) a completely self-supporting system, namely, the Victorian Bush Nursing Association; (ii) a system at the parting of the ways: the Victorian

public hospital system; (iii) a partially nationalized system, namely, the complicated English hospital system; (iv) a system almost completely nationalized, that of New Zealand.

In bringing this sketch to a conclusion the questions I wish to submit for consideration are as follow.

1. Are we to abandon our voluntary charitable system and nationalize (that soothing word) our hospital service? If so, we shall lose the humane feelings of the public and of the profession which brought the hospitals into existence and which have insured their continuance. The medical staff must then cease to be honorary. Unless the experience of other countries misleads us, the cost will be great if efficiency is to be maintained. But the choice must be made. It is obvious that the public has decided one factor—they intend, unless checked, to enter hospitals, and they do not or cannot pay even the cost of their keep. But the other essential factor has not been faced. It is quietly assumed that the medical expert will continue to act as if the system were a charitable one, so far as he is concerned. If nationalized hospitals make their appearance, the medical officers must be adequately paid if efficiency is desired.

2. As regards the intermediate hospitals, which, as I have stated, are not cheap enough, why should the contributory bush nursing principle not be applied and the cost to the patients substantially reduced?

3. Why should there not be hospitals of the bush nursing type placed in the suburbs and maintained in the same fashion as in the Bush Nursing Association?

4. What is the most desirable size of a hospital, whether regarded from the point of view of efficiency or economy?

5. Are we to continue practically to staff hospitals with nursing trainees, or are we to staff them with fully qualified nurses and to train nurses as we train students of medicine?

6. To what extent should the pre-graduate and post-graduate training of nurses be developed?

It is, however, obvious that the main question is whether hospitals are to be nationalized or not. If they are, the whole medical profession will inevitably sooner or later be nationalized. The choice must be made or we may drift by indecision into a position difficult to justify or to alter.

The only positive statement I, whilst occupying such a position, feel justified in making is as follows: the fault of the present hospital system is that the economic gap between the public hospitals and the so-called intermediate hospitals and the private hospitals is too great and should be bridged by a contributory system such as bush nursing, in which case the hospital charges for intermediate patients can be made very small. If such a contributory system is adopted by the profession they will, as in the Bush Nursing Association, exercise their just influence in managing it. If, on the other hand, it is supplied by the State or other organizations and the members of the medical profession do not play an active part in its establishment, then their control and influence will probably be negligible. Now is

the time to decide and to choose which system is preferable. But some provision of the kind is essential and is inevitable.

I have done my best to present these difficult questions in broad outline. It is now for a body of trained and thoughtful medical practitioners to reach positive conclusions. There is only one thing worse than a wrong decision, and that is indecision.

Adjourned Annual General Meeting.

THE adjourned one hundred and third annual general meeting of the British Medical Association was held in the Town Hall, Melbourne, on Tuesday, September 10, 1935, at 11 a.m., in the presence of His Excellency the Right Honourable Sir Isaac Isaacs, Governor-General of the Commonwealth of Australia, and His Excellency Lord Huntingfield, Governor of Victoria.

Induction of President.

Dr. S. Watson Smith, the President for 1934-1935, inducted Sir James W. Barrett to the office of President and invested him with the presidential badge of office. Sir James Barrett then occupied the chair.

Address by the Governor-General.

His Excellency Sir Isaac Isaacs welcomed to the Commonwealth the overseas members of the Association. He said that the importance to mankind which every conference of this nature invariably and inevitably carried, was heightened by the inspiring fact that the assembly was an inter-imperial one. He also expressed his satisfaction that Australia, a southern home of the British Family of Nations, had a profession which had served its people well and honourably and that it was a not unworthy scene for so historic a gathering.

A Message to the King.

Sir James Barrett said that he had asked the approval of His Excellency the Governor-General to send a telegram of loyalty to His Majesty the King. The following message was sent, the audience standing to signify its approval.

The British Medical Association, at present holding its annual meeting in Melbourne, Australia, desires to convey to its Patron, His Majesty the King, a message of unswerving loyalty and sincere devotion.

Before the conclusion of the meeting the following reply was received:

Please convey to members of British Medical Association, who are holding their annual meeting in Australia for the first time, my sincere thanks for the assurance of loyalty and devotion to which they have given expression on this memorable occasion. I am convinced that the interchange of ideas on these vital matters amongst the nations of the British Empire must be of benefit to mankind at large; and as Patron of the Association I send my best wishes for a successful issue to its deliberations.

(Signed) GEORGE, R.I.

Investiture of the Past-President.

Sir James Barrett invested Dr. S. Watson Smith with the Past-President's Badge.

Acknowledgements.

Finally, may I make the most ample acknowledgement of the assistance received in obtaining data from the Director-General of Health, New Zealand, Dr. Watt, and from the Assistant Secretary of the Victorian Branch of the British Medical Association, Mr. Ward. Without the generous help given the task would have been difficult.

Presentation of the President's Lady's Badge.

At the request of the Chairman of Council, Dr. E. Kaye Le Fleming, Mrs. Bishop Harman, wife of the Treasurer of the Association, invested Lady Barrett with the President's Lady's Badge for 1935-1936.

Introductions.

Dr. E. Kaye Le Fleming introduced to the President the following:

Newly Appointed Australian Vice-Presidents: Dr. Richard Herbert Fetherston, of Melbourne; Dr. William Nathaniel Robertson, of Brisbane.

Newly Appointed Australian Honorary Member: Sir Edward Mitchell, K.C.

Delegates from Kindred Associations and Federal Councils: Dr. R. D. Rudolf, Dr. Ritchie, Canadian Medical Association; Dr. C. M. Murray, Medical Association of South Africa, Federal Council; Dr. Wu Lien-Teh, the Chinese Government and the China Medical Association; Dr. Genzo Kato, the Japanese Medical Association; Sir Henry Newland, the Federal Council of the British Medical Association in Australia; Professor K. Herman Bouman, of Amsterdam; Dr. D. W. Carmalt Jones, Dr. J. S. Elliott, New Zealand Branch; Lieutenant-Colonel R. E. Wright, South Indian and Madras Branch; Dr. Guneratnam Cooke, Ceylon Branch; Mr. R. L. Almond, Mr. Max Greenberg, Southern Transvaal Branch; Dr. F. W. P. Cluver, Natal Coastal Branch; Dr. H. O. Hofmeyr, Cape Western Branch; Dr. R. A. Gardner, Egyptian Branch.

Association Prizes.

Dr. E. Kaye Le Fleming announced the award of the Sir Charles Hastings Clinical Prize for 1935 to Dr. Thomas Frederick Corkill, of Wellington, New Zealand, for his clinical study entitled "Obstetrics in General Practice in New Zealand". He also announced the award of a certificate of honourable mention in the Sir Charles Hastings Clinical Prize competition, 1935, to Dr. Evan Robert Lloyd for his clinical study, "The Results of Ante-Natal Work in an Industrial Community".

Sir James Barrett presented to Dr. Frank Macfarlane Burnet, of Melbourne, the Stewart Prize for 1935 in recognition of his investigations into the mode of action of bacteriophage and into the nature of virus diseases, also for his successful work on staphylococci.

President's Address.

Sir James Barrett delivered his President's address, entitled "Hospital Problems" (see page 429).

Vote of Thanks to the President.

On the motion of Dr. H. S. Souttar, Chairman of the Representative Body, a vote of thanks was recorded to the President for his address.

Public Lecture.

EUGENICS.

A PUBLIC lecture on eugenics was given by the Right Honourable Lord Horder. Lord Horder said that those who, in England, urged the claims of eugenics found themselves for the most part crying in the wilderness. But they believed that, just as John the Baptist preached a gospel which was followed by an epoch of momentous consequences in the world's religious life, so would the gospel of eugenics usher in an epoch in the physical and intellectual progress of the human race which would have comparably good results. There was a circumstance which made his choice of subject for an address in Australia all the more fitting. It was that the chief benefactor of the Eugenics Society, of which he (Lord Horder) had the honour to be President, had for some years past been a man of great enterprise and vision, who, though born and educated in England, had spent most of his life in Western Australia, where his affairs had prospered to a degree which enabled him to give £1,000 a year towards the work of the Eugenics Society for several years before his death in 1930, and to bequeath for the same purpose the residue of his estate, which was large enough to increase that donation threefold. This benefactor was Henry Twitchin, and it was appropriate that tribute should be offered to his memory. Henry Twitchin's interest in eugenics began about the year 1900, when the idea occurred to him of applying the principle that he had for a long time used in improving his farm stock to the improvement of the human race—the same idea that had occurred originally to the founder of the Eugenics Society. Twitchin had devoted his whole life to the breeding of livestock, in which the principle of eugenics was the controlling factor. Twitchin himself said: "Although my occupation alone would naturally have led me to this conclusion, it was the fact that I was born of unsound parents and inherited their weaknesses, and consequently have suffered thereby, that first forced this question upon me." He was prepared at first to advocate much more drastic measures than most enthusiastic supporters of eugenic reform considered practicable; but later he realized that the change could not be so revolutionary and that the best course was to educate people to see the inestimable advantage of adopting the principle. Because of his hereditary tendencies to unsound health, Twitchin never married, and since there were no relatives having any claim on his property he made his will almost entirely in favour of the Eugenics Society. It was not in the older countries so much as in the new, where deep-rooted prejudice was not so strong, that he placed his hopes for the success of eugenic propaganda; at the same time he realized that it was in the older countries that eugenic reform was most needed.

Francis Gattton, who coined the word "eugenics" fifty years ago, gave the following definition: "the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally". Gattton's ambition was so high that he was regarded by most people as a visionary. Surely to change the race was a fantastic idea, and consideration for future generations could not be expected of people who in the main were opportunists. Yet there were many organizations that concerned themselves with human betterment, showing an inherent desire in many to help their fellows. There was a large body of good intention, backed by tradition and culture, and supported by wealth, available for social reforms. But was all this expenditure of good endeavour directed into the channels that were calculated to produce the most fundamental and enduring benefits? Lord Horder thought that it was not. In the view of

the eugenicist the economic advantages lay with efforts made towards racial betterment rather than with social service in a particular generation. But the eugenicist's aims were hampered by the lure of immediate results, to which human nature was so susceptible. Temporary devices could secure only transitory and impermanent results, and though the eugenicist had no quarrel with the principle underlying wisely conceived social reforms, he must feel that some efforts in this direction seemed to be in the nature of tinkering, and therefore wasted from the eugenic standpoint. The eugenicist was more humanist than humanitarian in his outlook. The individual should not be pampered; he should live his own life; but every new life should be started on as sound a basis as possible. It was disturbing that in spite of national health insurance, maternity and child welfare centres, and vast sums of money spent on social services in England, one person out of ten was too dull or unhealthy to be absorbed into industry; one in 120 was mentally defective, and one in 300 was certified as insane. This was because nurture had been concentrated upon to the neglect of nature; heredity had been forgotten. Eugenics was the soundest and most profitable form of preventive medicine. In spite of deep-seated prejudice, civilization had advanced far enough for biological control in the human sphere to be achieved, just as completely as it was possible to achieve physical control. In reply to critics who would state that sufficient knowledge was not yet at hand upon which to put eugenic principles into effect, Lord Horder, whilst admitting that the present knowledge of genetics was meagre, would reply that more observation and research were essential. Though human genetics was more complex than the genetics of animals and plants, there was good reason for believing that the basic laws that were known to operate in plants and in animals operated also in human beings.

Supposing the principle of eugenics to be accepted as desirable, Lord Horder enumerated various measures that might be adopted to further it: (i) The study of genetics should be encouraged in the universities and schools, and research scholarships should be instituted. (ii) Genetics should be taught to medical students. (iii) The compilation of family pedigrees should be encouraged. (iv) Premarital schedules should be compiled by men and women intending to marry. (v) Pride in physical and mental fitness should be encouraged. (vi) The selfishness of childless marriages should be combated when both parents were healthy. (vii) If the bar against a family were economic, monetary assistance should be given. (viii) Voluntary sterilization, prompted by an enlightened eugenic conscience, should be encouraged. (ix) Birth control, a negative form of eugenics, should be taught through properly organized clinics to the people for whom it was most necessary; and such instruction should not be confined to women whose lives were in danger from subsequent confinements nor to those who were suffering from gynaecological diseases.

Lord Horder concluded his lecture with a summary of the aims of eugenics. The laws of heredity must be studied; people undertaking the responsibility of parenthood must be free from any disability that might be passed on by heredity; people who were sound in body and mind should have as many children as they could afford to bring up. These matters deserved the serious consideration of every citizen, and especially of young people who were entering on adult life and beginning to realize their responsibilities.

Combined Meetings of Sections.

SECTION OF MEDICINE AND SECTION OF SURGERY.

A MEETING of the Section of Medicine was held in conjunction with the Section of Surgery. SIR HENRY NEWLAND (Adelaide) occupied the chair.

Thyreotoxicosis.

The discussion was opened by LORD HORDER, who said that the term thyreotoxicosis was not altogether satisfactory—it postulated a basic fact that had never been established. He thought that the discussion should embrace the relation borne by the thyroid gland to the various clinical pictures met with, as well as the clinical pictures themselves, rather than be confined to the mere question of poisoning by a hypothetical thyroid dysfunction. Until some method of measuring the amount of thyroid secretion poured out into the blood stream was available, the main problem would not be solved. There were facts which suggested that the thyroid hyperplasia, characteristic of fully developed Graves's disease, was not the primary but a secondary phenomenon. There was certainly no quantitative relationship between the degree of thyroid enlargement and the degree or duration of the symptoms; there was no reason to believe that a qualitative relationship had been established; nor was there evidence that the cells of an adenoma itself yielded a pathological secretion. The *causa causans* remained hidden. That some poison was at work seemed an irresistible conclusion. The results of surgical operation suggested that the source of manufacture of the poison resided in the gland. Thyroidectomy might interrupt a vicious circle and so do good in quite another fashion than by getting rid of the cause of the trouble. It was feasible that the missing clue might be found extrinsic to the thyroid.

In regard to the aetiological factors, Lord Horder said that the existence of a diathesis in Graves's disease was generally accepted. Of predisposing factors a little was known: sex, certain collateral familial conditions and an autonomic imbalance. Of exciting causes there were the sex epochs, psychic traumata and focal sepsis. Lord Horder asked whether it was merely fashion that led to the mention of focal sepsis. He had been very disappointed in the search for focal sepsis in Graves's disease. The evidence regarding associated endocrine defects was entirely unconvincing. Discussing diagnosis, Lord Horder said that difficulty lay in a recognition of the early and incomplete pictures. Training in the observation of faces and behaviour was most important. When these deviated from the average, the clinician should not rest until he had a positive, not merely a negative, explanation. There was a tendency to seize on a patient too soon after a first contact with her and to put her through the mill of a routine examination of her organs. Graves's disease in its early stages was a disease of the patient and not of her organs. If the clinician took time to "stand and stare" he would have a chance of observing whether the patient was staring and why. Lord Horder described the many slight changes in manner and movement that were noted in the early stages of the disease.

As far as treatment was concerned, the recognition of the diathesis called for preventive treatment; this was a thankless task. In the slighter forms of the condition the chief difficulty next to the temperament of the patient lay in securing relief from excessive strain on the nervous system. The simple life was necessary, and for those patients who accepted the control and cooperation of the medical attendant, there was a good promise of stabilization. If the symptoms persisted in spite of controlling the patient's routine of life, and whenever the full

syndrome had developed, absolute rest in bed for at least three months was needed. If focal sepsis was present it should be eliminated. There were no specific drugs; there were some that would help. The question of partial thyroidectomy remained. In his experience the operation should be undertaken whenever the disease remained active after six months of carefully supervised medical treatment and in cases which relapsed in spite of the patient's routine of life being adequately controlled. He agreed too that operation was indicated in all cases in which auricular fibrillation had developed and that it was still more necessary when signs of congestive heart failure were present, whether the cardiac rhythm was affected or not.

SIR THOMAS DUNHILL (London) began his paper by paying a tribute to the memory of the late Sir Richard Stawell, who, he said, had the faculty of kindling in his associates and students a desire for more accurate knowledge and of transmitting to them an eagerness in its pursuit.

Turning to the subject of Graves's disease, he said that the disease was not standardized because human beings were not standardized. The protoplasm of each individual had its predestined faculties. The wonder was not that endocrine balance was sometimes upset, but that in the great majority of persons it was reasonably good. The secretion of the thyroid gland was accepted as giving rise to the manifestations that constituted the disease, and the gland had to stand up to the buffetings and vicissitudes of life. The more that was known of heredity, environment and associated conditions, the better would clinicians be fitted to deal with a condition of which knowledge would necessarily remain for a long time imperfect. It was well to remember that while knowledge was so imperfect, some patients would fail to regain normal health whatever method of treatment was followed.

Sir Thomas Dunhill then went on to discuss the complications. He divided these into several groups, and in discussing each group he referred to patients from his own series. The first group included cardio-vascular complications. The number of patients with established auricular fibrillation upon whom he had operated was 260. Of these, 218, or 84%, had regained regular rhythm following operation; seventeen, or 6.5%, had died; twenty had not regained regular rhythm, and five were untraced. The second most common complication was glycosuria (52 patients in his series). Before operation glycosuria might be difficult to control, even with insulin. Sir Thomas Dunhill quoted several patients to show that after operation glycosuria could be controlled. Mental derangement (43 patients in his series) was possibly the most pathetic complication. The question to be decided was whether the derangement might have occurred apart from the thyreotoxicosis or whether it was due to the disease. In this regard the family history should be carefully examined, and the help of a colleague skilled in mental disorders should be sought. To illustrate the risks of operating on patients foredoomed to mental derangement, he said that three of his patients who appeared to be mentally stable became demented for periods up to three months and then became mentally normal; another, mentally unstable before operation, committed suicide some months later, and one had failed to recover. He believed that all the others—they numbered 43—had regained normality. He did not include in this group those with mental irritability, however severe it might be. Probably the most difficult group of patients for either physician or surgeon, and the most dangerous for operation, were those with extreme emaciation—those who, in spite of every form of treatment, continued to lose weight. In the last three years he had had three patients in whom the loss of weight had been three and a half stone. It was chiefly because of the patients in this group that there would always be a death

rate after operation of about 3%. When considering the death rate of operation it was to be remembered that sudden deaths were not infrequent in this disease apart from operation. Pruritus in Graves's disease could be severe (23 cases in his series). Many of the patients were unable to restrain from scratching themselves until they bled over a considerable part of the body, and could not obtain relief until the disease itself improved.

Discussing the time for operation, Sir Thomas Dunhill said that the time at which operation was performed had been steadily advanced. The average patient gave no anxiety. Among the severely ill there were those who could be brought safely through by making in the beginning the smallest incision that could be depended on to achieve some good. It was not true to say that all patients when seen by the clinician could be made safe with iodine; nor was it true to say that all the poison was in the gland and that therefore the best way of dealing with the patient was to remove the greater part of the gland at one operation.

In regard to the results of operation, it was well not to speak of the excellent results that were generally obtained, but rather was it important to say that sometimes it was impossible to "hit it off exactly".

Sir Thomas Dunhill said that he had seen 51 cases in children under the age of seventeen; of these, 14 had been under the age of twelve, 9 under eight; the youngest was four years of age. In one patient ligation of arteries had sufficed; in 16 partial thyroidectomy had been necessary.

Regarding X ray treatment, Sir Thomas Dunhill said that it had a place in the management of Graves's disease; and in his view its chief value was in the early stages and in young people. In severe cases and in older patients he did not think that its results compared favourably with those of surgery.

PROFESSOR C. E. HERCUS (New Zealand) stated that thyrotoxicosis was very common in New Zealand and that New Zealand physicians had to be thyroid-minded. New Zealand had a higher death rate from this cause than any other British country. The toxic incidence and death rate were highest in the endemic areas—greater than anywhere in Australia, and thrice as great as in Great Britain. Whether the cause was exogenous or endogenous, the facts remained that patients with an enlarged thyroid gland were much more liable thereby to thyrotoxicosis. In the thyroid clinic at the Dunedin Hospital all patients were admitted to a medical ward for full investigation and were then followed up after operation. They found it very difficult to find any cases of goitre without some evidence of toxicity, and the former clinical division into primary and secondary goitre had no actual pathological basis. He had observed a frequent familial incidence among his cases.

DR. A. W. HOLMES & COURT (Sydney) stated that all types and varieties of the disease described by previous speakers had their counterpart in Australia. At the Sydney Hospital the principles laid down by Sir Thomas Dunhill and the Melbourne school of clinicians were closely followed. The therapeutic indication was to abolish the abnormal activity of the gland after the taking of iodine had produced the maximum remission; this remission usually occurred after a period of about two weeks. At the present stage of knowledge the means of producing permanent reduction of activity of the gland were two: irradiation and subtotal thyroidectomy. In a small proportion of selected cases a favourable result might frequently be produced by irradiation in expert hands, provided always that the disease belonged to the type in which there was thyroid hyperplasia, generally diffuse in character, without nodule or cyst formation or localized tumour. In regard to the so-called primary Graves's disease types, the general consensus of opinion appeared to be that a subtotal thyroidectomy in the fully iodinated subject gave the best prospect of relief. It should be clearly recognized that in the treatment of such patients there was no antagonism or divergence between medical and surgical measures; rather the closest cooperation should exist between physician and surgeon in the interests

of the patient. The rôle of the physician should be to prepare the patient for operation and subsequently to supervise a follow-up for at least two years, having particular regard to evidence of recrudescence of thyrotoxicosis or to the development of myxoedema.

SIR CARRICK ROBERTSON (New Zealand) analysed the results of 754 patients suffering from thyrotoxicosis operated upon by him during the past five years. Of these, 80% were toxic. He was convinced that in New Zealand the toxicity of adenomatous goitre was increasing. He believed that nearly all these goitre patients eventually developed hyperthyroidism, a result to which the indiscriminate use of iodine no doubt contributed. The patients giving the most trouble in diagnosis were the psychoneurotic, but patients with early pulmonary tuberculosis, rheumatic heart disease or myocardial degeneration also provided pitfalls; but their condition was rarely associated with an increased appetite or an increased tolerance for cold. His practice was to remove from four-fifths to five-sixths of each lobe, and he aimed to do the operation in one stage if possible. He was satisfied that thyroid crises were not nearly so frequent as when half the gland was left behind. He was not convinced that preliminary ligation of the superior thyroid artery improved the patient, and deaths had been reported from this simple procedure. The chief complications in his series had been post-operative hemorrhage in thirty, loss of voice in sixteen, tetany in ten patients. Mortality amounted to 0.9%. Two of the seven patients who died suffered from "woody" thyroid; four suffered from the type described by Lahey as "apathetic" hyperthyroidism. These were the patients most suited to two-stage operations.

DR. H. HUME TURNBULL (Melbourne) asserted that the rôle of the physician was confined to diagnosis. Medical treatment, in his opinion, was almost entirely without value. Patients sometimes recovered even without rest, while continuing to work, or, after remaining in bed in hospital for long periods, were discharged without having shown much improvement, but returned for observation later, quite better. No real medical treatment existed apart from iodine administration, although both patient and physician deluded themselves for years in this regard. He was profoundly impressed with the results of surgical treatment. With regard to focal infection, he thought that its eradication never enabled the patients to dodge surgical treatment. Dr. Turnbull had obtained much help in diagnosis from observations of the pulse rate during sleep; if it was below 75 per minute the patient should not be considered a candidate for operation. In general, operation was rarely urgent in the younger patient, but in older persons the time factor became important. Thyroid secretion poisoned the heart in a definite manner, producing at first paroxysmal fibrillation and, later, permanent arrhythmia. In such patients a low basal metabolic rate was insufficient entirely to exclude hyperthyroidism as a cause of the fibrillation. Use could be made of iodine as a diagnostic agent, especially in nodular goitre, providing the patient was kept under close observation. He directed particular attention to the exacerbation following fourteen days after stopping the drug. In patients with recurring nodules and arrhythmia the possibility of complete thyroidectomy should be considered.

DR. ALAN NEWTON (Melbourne) stated that he had operated upon 512 patients, a number just sufficient to convince him of his ignorance. He stated that the increase in the death rate from Graves's disease in Victoria was by no means so startling as that in Great Britain. He had not often observed the complications described by Sir Thomas Dunhill, and asked whether he had also detected a regional variation in symptomatology. No doubt Sir Thomas Dunhill's figures were influenced by the fact that he had dealt with the worst cases in two countries. In Melbourne it was unusual to meet a long-standing example of the disease. Dr. Newton described certain complications which might develop rapidly, of which one of the most troublesome was severe exophthalmos, apparently due to swelling of the external ocular muscles, and reaching such a degree that the eye

might be lost through corneal ulceration. Another was the curious myasthenic change which affected the muscles of the upper half of the face and prevented voluntary closing of the eye. Recovery occurred following operation. In mild instances of Graves's disease medical observation should be closely continued. The use of iodine should be restricted to the immediate pre-operative period. The pre-operative period was of such supreme importance that the nurses should not be changed and that this phase should be entirely conducted by the surgeon. The mortality in his hands in private practice amounted to 0.4%, with no deaths in the last 212 cases. At the Royal Melbourne Hospital he had lost 3.0% of 150 patients. In 118 cases in which a subtotal resection was performed at the Royal Melbourne Hospital, 86 patients were apparently cured, three had mild symptoms, 23 required treatment for hypothyroidism, four died some time after operation. He considered that X rays had their chief value when regeneration occurred after operation.

DR. S. PERN (Melbourne) stated that he knew of many patients who had been completely cured by removal of all septic foci. It was necessary not merely to open a focus of infection, but to eradicate the danger completely.

DR. S. V. SEWELL (Melbourne) said that treatment for focal sepsis should follow and not precede operation. The physician had no right to treat a patient except in the very early stage. Dr. Sewell praised pre-operative irradiation of the gland. Until the exact etiology was known, the gland should be dealt with directly before circulatory distress appeared.

DR. C. E. DENNIS (Melbourne) asked Lord Horder whether he had seen any benefit from small doses of X rays continued over many weeks. He quoted a patient who had shown great improvement after this procedure. Formerly irradiation had been probably too strong and was frequently associated with complications.

DR. HUGH POATE (Sydney) stated that in his experience in New South Wales classical exophthalmic goitre was rare, though patients with other signs of thyrotoxicæmia were common. Young patients with fleshy thyroids and predominantly cardiac symptoms provided had surgical risks and were best treated by irradiation. In middle age irradiation became of less value. X rays were similarly of little use for patients whose symptoms were mainly nervous in type, and for those queer patients who gained weight instead of losing it.

PROFESSOR A. M. DRENNAN (Edinburgh) stated that the preventive aspect of goitre had not yet been given emphasis. Goitre could be produced experimentally by the injection of thyroxin and pituitary extract, and this result could be prevented by iodine, more particularly when thyroxin was used. Endemic goitre was becoming less common in New Zealand, largely as a result of the efforts of Professor Hercus, which had resulted in the general use of iodized salt, and latterly of a preparation from seaweed. If simple goitre could be so prevented, so could toxic goitre. The gland acted as a storehouse for iodine and became enlarged to a point at which a balance was obtained between the size of the gland and the needs of the patient. Though the gland was a storehouse, the iodine concentration was actually low; a rise in concentration produced toxic goitre, because the gland was then too large for the individual under altered conditions. Too much iodine in hyperplastic goitre caused excess storage. The aim of surgical treatment was actually to reduce the mass effect of a gland which was too large for the patient's needs.

DR. F. S. HANSMAN (Sydney) referred to certain experiments made at the Royal Prince Alfred Hospital, in which a negative phosphorus and calcium balance had been found to occur in hyperthyroidism, probably due to an associated hyperparathyroidism. Efforts had further been made to see whether the calcium balance could be influenced by diet *et cetera*, and whether any clinical differences were found in association. A negative balance was uninfluenced by rest and iodine, but following the application of deep X ray therapy to the gland the balance became positive, with improvement in clinical symptoms.

Lord Horder, in reply, advised forbearance in terminology, though on this occasion he had been forced to use the terms exophthalmic goitre and hyperthyroidism synonymously. From the statements made by some of the speakers, it appeared that greater differences might exist in Australia, but one had to be sure that one was not dealing only with an early phase of the disease in which all the cardinal features were not present. He could not understand Dr. Turnbull when he stated that the surgeons should have the sole right of deciding the time of operation, though he agreed that the more advanced the case, the better the surgical result. Surgery could help enormously by interrupting the vicious circle just as splenectomy could help in splenic anæmia. Dramatic results followed when the surgeon was permitted to choose the right case, but the stage, if operation was required, remained the sphere of the physician. It was necessary to be careful against confusing the natural excitement of the patient during a medical examination with the signs of thyrotoxicæmia. He asked what was the evidence that the early case was necessarily a result of thyrotoxic dysfunction. It had been stated by one speaker that the sufferer from Graves's disease was never restored to robust health, but Lord Horder assured the meeting that Sir Thomas Dunhill's patients really were. In conclusion he said that the earlier the operation was performed, the less satisfactory became the result. "Use the operation too early if you wish to do thyroidectomy a disservice."

Sir Thomas Dunhill, in reply, stated that he regretted that physicians did not concern themselves more with the earliest cases. In reply to Professor Hercus, he expressed his surprise that goitre in New Zealand should be so constantly associated with symptoms of toxæmia. In this regard he stated that one must be sure that the patient had not been taking thyrotoxic gland by mouth prior to examination. He hoped that Professor Hercus would prepare more exact details of his cases for circulation among the members present. He was anxious to disillusion Sir Carrick Robertson if the latter considered that it was his habit to perform the operation in two stages. It was much easier to operate in one stage, but one must be careful to keep the patient alive for the second stage. Every year a few patients died while waiting for operations. There were surely many more on the verge of such a tragedy whose lives could be saved only by doing the operation in two stages. In reply to Dr. Dennis's question regarding the use of X rays in early cases, he thought that this measure was of value for patients seen in the very early stages at which they consulted the general practitioner, and he regretted that the general practitioner had not been heard more in this discussion. He had seen benefit result in six out of thirty very early cases, especially children. As regards adults, however, of 140 patients irradiated, 118 had established auricular fibrillation following "cure" by this means.

SECTION OF PUBLIC MEDICINE AND SECTION OF MEDICAL SOCIOLOGY.

MEETINGS of the Section of Public Medicine were held in conjunction with the Section of Medical Sociology. DR. E. KAYE LE FLEMING occupied the chair.

Australian Aerial Medical Services.

DR. ALLAN VICKERS (Western Australia) opened a discussion on the Australian Aerial Medical Services. He said that the Aerial Medical Service, commonly known as the "Flying Doctor" service, was justly associated with the name of the Reverend John Flynn, whose work as Superintendent of the Australian Inland Mission (the Bush Department of the Presbyterian Church) had since 1912 taken him constantly into the huge sparsely settled areas of the back country of Australia. In this back country thousands of settlers were scattered whose nearest hospital and doctor were often two hundred miles away

and whose means of communication and transport were in most cases primitive. Mr. Flynn attacked the problem of supplying improved medical facilities for these present-day pioneers and, acting under his inspiration, the Australian Inland Mission had established at some of the most isolated outposts small hospitals, which were staffed by two trained nurses. Depending on land transport, however, these hospitals could serve only a comparatively limited area. Mr. Flynn conceived the idea of having a doctor established at a central base and using an aeroplane, not only to reach the patient, but also to transport the patient to an adequately equipped hospital for treatment. But how was the outback settler to summon the doctor to his aid? Mr. Flynn's solution was: "give them wireless". At first both aviation and wireless were too primitive and unreliable to enable this vision to be realized; but before many years the scheme became practicable. Aviation had advanced, and in 1926, after several years of experiment and the expenditure of several thousand pounds by the Australian Inland Mission, a suitable transmitting and receiving set was designed. A special fund to finance the wireless scheme had in 1927 grown to £7,000, and in May, 1928, the first aerial medical service base was established at Cloncurry.

The central wireless station at Cloncurry employed a maximum power of 500 watts, and might be operated on one of several wave-lengths suitable for conditions in that area. The small wireless sets installed in isolated homes could not only receive, but also transmit messages to the Cloncurry base. For distances up to two hundred miles communication from an outpost set to Cloncurry (or between two outpost sets) might be carried on in ordinary voice; for greater distances it was preferable to use Morse code, which, for simplification, was sent by an automatic transmitter, an instrument with a keyboard much like that of a typewriter. There were now thirty-five outpost wireless sets installed in isolated places that lacked any other means of communication. The nearest outpost set was 120 miles and the most distant over 700 miles from Cloncurry.

The ambulance aeroplane was a cabin type of machine adapted to carry a full-length stretcher, so that patients travelled lying comfortably and sheltered from the weather. There was room for the doctor to move about beside the patient, and a third person could be carried. A complete battery-operated transmitting and receiving wireless set was carried. This was invaluable if a forced landing were necessary or if it were necessary for preparations to be made at the hospital for a major operation. Moreover, ground organization was being built up in regard to petrol supplies and landing grounds.

Dr. Vickers pointed out that the activities of the Aerial Medical Service fell into several classes. The wireless facilities made it possible, when a case was reported, for the doctor to make a provisional diagnosis and to give instructions as to treatment. In many cases such advice was given only as a measure of first aid until the doctor could arrive. But in minor cases instructions given by wireless might avoid the expense of hundreds of miles of flying. It was in cases of grave emergency, however, that the Aerial Medical Service was seen at its best. When violent accidents occurred, or any of the common surgical emergencies, it was invaluable for the patient to be transported quickly and comfortably to hospital. Moreover, patients transported by air were remarkably free from surgical shock due to pain; and many lives were saved by the promptness of the medical treatment. For patients suffering from chronic complaints, or whose eyes and teeth needed attention, the doctor could often delay a few hours and give them the necessary treatment.

At each of the six small towns within the area covered by the Cloncurry base there was a resident medical practitioner, who was guaranteed a modest income by the local hospital board. At each town there was also a small hospital, usually staffed by one trained nurse. But hospital equipment was meagre, and there was no refrigeration or X ray plant. The "Flying Doctor" made it possible, however, for these outlying practitioners to see a colleague in consultation within a few hours and to

obtain necessary equipment at short notice. After consultation a patient might be transferred to Cloncurry, where an X ray plant and more complete surgical equipment were available. In one sense the "Flying Doctor" scheme was as great a comfort to the doctor himself as to the patient under his care.

Dr. Vickers spoke of the Aerial Medical Service as providing a stimulus to permanent settlement in isolated areas, and as being for this reason of national importance. Fear of illness or accident would make many men hesitate to take a woman and children to the outback where they would be beyond medical aid. The Aerial Medical Service gave a feeling of security and peace of mind to those living in isolated places. There still remained many isolated homes far beyond the reach of the Cloncurry base. A scheme providing for six such bases, which would cover the whole of the sparsely settled country, had been visualized and should attract the support of the whole of the Australian people. At the Premiers' Conference of 1934 the service had been discussed and it had been resolved:

That this conference approves of a general cooperation of the governments of the Commonwealth and the States with a view to furthering the Australian Aerial Medical Services scheme.

Dr. Vickers then proceeded to discuss finance, and said that the service should not be free, nor should the settlers pay the full cost. He thought that some form of contributory scheme would meet the situation. Whatever the future might hold, he believed that the Aerial Medical Service had proved that it merited a place in the scheme of things medical in Australia.

THE REVEREND JOHN FLYNN (Sydney) wished to express his deep appreciation of the interest which the British Medical Association had taken in this meeting, and of the honour done to him by including him in the scheme of things. He would content himself with emphasizing some of the points which had been raised. It was particularly interesting to him, having passed through the process, to note the public enlightenment in recent years upon the interior of Australia. The word "desert" was becoming one of the most familiar words in the Australian language. The loneliness of the Australian frontiers was a feeling absolutely unknown to Europeans. Most people would agree that in extremely difficult cases of illness the patients should be taken to a city, but there were small centres within reasonable distance of the interior, with a population of one thousand, capable of dealing with 99% of cases that came along. He was told by Professor Griffith Taylor that in those parts where the rainfall was below ten inches in the year, it was likely that for many years to come the population would be just the same as it was today, and because of that medical services had to be planned for the lonely people in those parts. The three medical bases started by the Australian Inland Mission, namely at Port Hedland, at Wyndham, and at Cloncurry (seven and a half years operating), were still in the experimental stage, and it was hoped to have them transferred soon to the Australian Aerial Medical Services. The thirty-five wireless stations in the interior should be increased to five hundred. The area served by the additional wireless transmitting sets would be less than the experimental area. Under the new régime he hoped that Dr. Fenton would be relieved of some of the heavy burden which he carried today. He was doing good work in the Northern Territory. It was desirable that improved transport facilities should be provided to enable relatives to follow the patient into hospital. One family took three weeks to return home. It might be necessary to take an occasional patient to one of the great metropolitan hospitals for special treatment. Lately one patient was taken for treatment to Brisbane. It was important: (i) that the work of the Aerial Medical Service should be coordinated with that of all local hospitals and medical services; (ii) that the project should be Australia-wide, working under one general ideal, one sentiment; (iii) he advocated a "British frontiers medical union" of some kind. It was desirable

that every man in isolation be afforded the opportunity of fellowship, and they should bring together in one great alliance philanthropy, imperial sentiment and medical advancement.

DR. J. NEWMAN MORRIS (Melbourne) said that the problem was to afford efficient aid to every isolated pioneer, a need which had been met in various ways in different parts of the world. The pioneer needed this assistance no less than the man on board ship unprovided with wireless equipment. It had been proved that in the vast empty spaces of Australia a useful medical service could be provided. The Western Australian Government had provided Dr. Coto with the means for flying, wireless equipment, the maintenance of the medical posts at Port Hedland, and £1,200 *per annum* to keep the plane in the air. The plane was named the "Dunbar Hooper" to commemorate the work of the late Dr. Dunbar Hooper, and he hoped that the Port Hedland plane would be called the "John Flynn". The aim would be to bring every settler within twenty or thirty miles of a transmitting wireless set. There was no fear of any encroachment upon private practice, no fear of supercession or overlapping of the work of other medical practitioners. Undoubtedly it would be part of the medical services of the whole country in the future. The new system would bring medical aid to every settler within a space of three or four hours.

DR. GEORGE SIMPSON (Melbourne) said he felt honoured and privileged to have been associated with the development of the Aerial Medical Services in Australia from the beginning. Only those who had lived and travelled in the vast empty lands of Australia could fully realize the needs for such a service. Only those intimately connected with the service could appreciate the difficulties that had been encountered and overcome in its development. Members from Great Britain would be interested to know that very helpful advice and assistance had been received in the early days from Colonel G. A. Moore, Deputy Chief Commissioner of Saint John's Ambulance Brigade. It was strange that they should find a parallel between conditions in Australia and those in the north of Scotland. Australian aerial medical services were improving conditions of medical practice in the same way as the Highlands and Islands Service was doing, so that men of high professional capacity were attracted to the work.

COLONEL C. I. ELLIS (Surgeon in Charge of Saint John's Ambulance Brigade) said that he came to be informed, but he could say that he was thrilled with the work done and with the advances that had been made by the Australian Inland Mission aerial services. He thought it would be well if the settlers were to be instructed in the principles of home nursing and hygiene before going to the isolated outposts. In England they had formed an Air Ambulance Detachment—one in Surrey and three in Lancashire. Voluntary Aid Detachment nurses were trained to go in air ambulances to nurse the sick; there were twelve nurses trained for this purpose.

DR. E. KAYE LE FLEMING (London) expressed his thanks to Dr. Vickers for so clearly putting before them the story of the extension of the medical services, which to him seemed like a romance and one which must have a far-reaching effect in other countries of the world. It required little vision to see to what extent the service could develop. He congratulated Dr. Vickers upon the great pioneer work, which must prove of inestimable value to the whole of civilization.

Racial Pressure Problems in the Pacific.

SIR RAPHAEL CILENTO (Brisbane) opened a discussion on racial pressure problems in the Pacific. He said that he wished to show the dangerous uncertainty of the population balance of the Pacific; how specialized to a city environment Australia's population was in the main becoming; and how those checks on population that economic stress had for some time been introducing in Europe, while they might save western civilization from disaster, might, on the other hand, bring Australia to ruin. The only possible safeguard of this country, if it

could not be quantity, must be quality—a population of ideal health, both mental and physical.

The paper was based upon three propositions of a provocative nature, namely: (i) every culture had its rise to dominance, its stalemate in disillusion, and its fall; (ii) populations tended always to increase to the limits of subsistence, unless checked by war, disease, economic misery, or deliberate limitation; and (iii) that very specialization to a particular environment which was such a notable factor for advancement in the first instance, became finally a weakness, fatal if the environment was suddenly changed.

With regard to the fate of cultures, Oswald Spengler's demonstration was quoted, to the effect that the course of the history of each culture conformed so closely to one standard as to make all essentially identical and to give some basis for forecasting present tendencies from ancient facts. It was asserted that, on the other hand, Spengler's standpoint was entirely metaphysical and was definitely at fault in failing to emphasize the importance of disease and famine in the fate of cultures. Spengler had sought no physical stimulus in that first stirring towards progress in the basic barbarian mass, and had scouted any scientific explanation of the enormous decline of population—the race suicide—that ended any civilization. He had postulated as sufficient a metaphysical "turning towards death", seen only at the end of a culture and in city populations. Nothing could be further from the truth. Precisely the same conditions were discovered among native populations, not in cities, but in savage Oceania, and the factors operating adequately to explain their decline were such introduced diseases as malaria, hookworm and tuberculosis, faulty sanitation of environment, privation and poverty of diet, and abortion and infanticide.

Sir Raphael Cilento sketched briefly the depopulation and the disillusion that accompanied the decline of any great culture and correlated them with similar tendencies found today; but he pointed out that, though this attitude of disillusionment and fact of depopulation were definite and admitted, they were merely the negative phases that followed a period of over-population and, indeed, tended to correct its consequences. Both the upward and the downward trend of the population graph resulted from some new and favourable aid to productivity which made a dramatic entrance in what might possibly have been an age-long period of calm. With present-day civilization it was the massed labour provided by the machine age. Extra labour meant extra food, and extra available food always tempted population to the borders of subsistence.

During the positive phase a tremendous impetus had been given to the peoples of western Europe by the fact that the world lay open to the exploiter, and in the Pacific it produced three "moonlight" civilizations—civilizations that took their light from a live source—the United States of America, Australia, and Japan. In the same Pacific the impact of the new civilization had had variable results. With peace and increased productivity, the Dutch East Indies had responded by an increase of population from 8,000,000 in 1816 to 37,000,000 a century later. But the over-specialized primitives of the Oceanic islands, on the other hand, had lost 75% of their total population in two generations. The negative phase had been shown in western Europe by the realization of the fact that there was an enormous disparity between production and availability and that, with the betterment of machinery, it became increasingly difficult to provide employment of a gainful nature, which was in fact "subsistence" in the Malthusian sense. The rapid fall of the birth rate, the declining proportion of youth, and with it of potential mothers, should all actually correct the disparity between population, production and consumption, naturally and desirably, but this had previously never occurred without inevitable conflict and destruction of culture.

Japan's population had been balanced and stationary for three hundred years until 1868, but subsequently, with the increase in food, wages, standards and the legal banning of the intensive methods of contraception of the Tokugawa period, the population had lost this balance

and had increased in sixty years from 28,000,000 to 60,000,000. It was inevitable, on present figures, that the population of Japan proper should reach 113,000,000 in 1967, while England, America and Australia were already approaching stalemate. The natural increase in Australia in 1931 had been half that of 1891.

From the experience of Oceanic stocks, disease and food deficiencies, and not Spengler's metaphysical hypothesis, might explain the decline of primitive and sophisticated alike. The one thread that connected the whole series of observations was the interacting influence of population upon subsistence, and subsistence upon population, both in quantity and quality.

Australia depended today for her defence and development upon peace and security, for which there was no guarantee, while Italy, Russia, Germany and Japan, discounting any reliance upon conciliation and concession, had encouraged a hyper-nationalism that might readily become imperialistic. Meanwhile the seeds of conflict lay in the continually intensifying economic war, while the steady trend of thought towards idealistic socialism limited ambition, cooled ardour, and lowered vitality in a national sense.

The stream of population in Australia, parched by the economic drought, had dwindled to a trickle. Unless quality replaced what was lacking in quantity, it was possible that Australia might fail to survive the period of increasing racial pressure that appeared imminent and inevitable in the Pacific. That meant that it was essential to have a population of ideal health and the dominant mentality that went with it.

SIR JAMES BARRETT (Melbourne) referred to the extraordinary position in Hawaii, where Japanese held the majority of votes and where successive importations of various races, Chinese, Japanese, Costaricans, Portuguese, and now Filipinos, had been made to supply field labourers, each race in turn migrating into the city. In Fiji the Hindoo was thriving. The Native Medical School, backed by the Rockefeller Foundation and the British Government, gave a four-year course for native medical practitioners, who returned to their own islands. A white medical service would have a prohibitive cost. The Northern Territory of Australia, while not in any way physiologically impossible to the white race, and practically free from tropical disease, was an economic failure. Much hard thought by capable people, and the expenditure of seventeen millions of money had resulted in colonization by four thousand people. The summer rains of the Northern Territory and a long dry winter spell were unfavourable to agriculture. A beast had yet to be invented that was tickproof and manageable to meet pastoral needs. Cattle and sheep failed to breed in the long dry winters. He drew attention to the south coast of Java, with similar soil and climate, which was just as empty, though forty millions of people lived alongside. From the western border of Queensland to the Indian Ocean only 6,500 whites existed. Mortality rates were not low, and irrigation was essential for continuous cultivation. Its only possibilities were pastoral and mineral. Sir James Barrett ended with a quotation from W. Wynne Williams's "The Settlement of the Australian Tropics". In this quotation Wynne Williams stated that Australian tropics, "with the exception of the narrow east coast strips, will never hold a population of any magnitude of our own or of any other race of people". The quotation concluded with the following words, written by Professor Griffith Taylor:

We must break up the large alienated holdings, and the small ones too, if they are not utilized for the common good. Let us leave the empty spaces to the pastoralist, for whom nature meant them. Their development will proceed along different lines from those leading to close settlement. It is the same in Australia as everywhere else, the manufacturer and the farmer who will determine the dense population. My earnest counsel to those who ponder this problem during this time of financial stress is that we should tackle the arid lands and the tropics later—much later—and leave the desert to its loneliness.

DR. D. G. CROLL (Brisbane) said that Spengler's theory should not be accepted as inevitable; rather should it be critically examined. The first three ages of human existence were: the primal, the stone age, the agricultural and mechanical age, the last mentioned covering the four thousand years ending a century ago, and including all the great cultures mentioned by Spengler. Man was now at the end of the first century of the fourth or scientific age, as far ahead of people of one hundred years ago as they had been ahead of the ancient Egyptians four thousand years previously. Spengler's ideas did not forecast the fate of a culture in a new age. The dangers in Australia were real and imminent. To hold Australia with adjacent large populations in Netherlands East Indies and Japan, the population had to be increased either by birth rate or immigration. Drastic steps were essential. Coercion by laws against abortion or against the sale of contraceptives had failed and would always fail. Improvement in infant and maternal mortality was admirable, but of little effect. Fear was not a material factor—women did not hesitate to run the great risks of abortion. Education might help a little, but the better educated had a lower birth rate. Economics was all-important. The average couple did not desire more than two children; the State would prefer six children or more. The State could obtain the extra four by paying for them, making the economic position of the family of eight as good as that of the family of four. Immigration had its difficulties; Australia ought to have the right kind of immigrant and find him employment. Even if both these things were done, Australia could not compete in numbers. Medical science was the one solution left. Dr. Croll quoted Sir Henry Brackenbury in "The Modern Conception of Health". "The modern conception of health embraces the whole of the human personality, and the health services of the country, if they are to fulfil their proper function, must concern themselves with the full development of all the powers—physical and mental—of which man is capable." He would only add spiritual powers, for "it is the spirit that quickeneth". Such a health service was Australia's only safeguard.

THE REVEREND JOHN FLYNN (Sydney) said that the answer to the question "Does history repeat itself?" was: "Never altogether." The international development of the world should teach man to cease thinking in terms of race or personal geography. The future of Australia could not be entirely settled in Australia by Australians. One could lose many foreign countries in the uninhabited part of Australia. Switzerland, even Great Britain, could be dropped in a single cattle station. Australia was not unlimited; meteorological rainfall boundaries limited it. Foster Fraser's statement that Australians were wonderful people—they could do anything they liked except breed—might on the evidence be true.

DR. A. GRAHAM BUTLER (Canberra) drew attention to Mr. S. M. Bruce's statement that consumption and production must be coordinated; production in the past had been stressed; consumption must in future also be studied. The policy of proper quality of the race should in any case be maintained.

Sir Raphael Cilento, in reply, remarked that similar pessimistic statements to those of Dr. Wynne Williams were to be found in volumes dating from 1839 to 1867 concerning the impossibility of colonization of areas like north-western Victoria, Brisbane, Maryborough, their premonitions gradually retiring to western Queensland, till artesian wells were developed. North of Gympie land which had been proclaimed unfit for man or beast had been developed into the premier dairying area of Australia. The desert complex had occupied too much attention. China had enormous deserts and also an enormous population. The fringe of Queensland extended for seven to three hundred miles from the coast, and in total extent was larger than the arable land in southern Australia. He deprecated emphasis on the unoccupied third of Australia, but advocated concentration on the larger areas and the greater possibilities.

Section of Medicine.

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Obesity.

PROFESSOR C. G. LAMBIE (Sydney) opened a discussion on obesity, its aetiology and metabolism. Professor Lambie defined obesity as excessive accumulation of depot fat in storage areas, whether or not it was to be regarded as disfigurement or as a sign of disease. The standards of what constituted normal bodily configuration were based on large numbers of persons collected at random. The number of obese persons became less if individuals were correlated according to build.

On the debit side of an energy balance table they had expenditure of calories: (a) for basal metabolism, which consumed by far the largest amount of heat; (b) by exercise, which required relatively few calories; (c) specific dynamic action, the technical measurement of which in man was difficult. The last mentioned represented the smallest fraction and was mostly decreased in obesity. Food constituted the credit side of the balance and was the most important single variable factor. If the energy intake was less than the energy consumption there would be a loss of energy building tissue, otherwise the laws of conservation of energy and mass would be contravened. This was the basis of all rational treatment. On the other hand, the important problem in obesity was what happened to food taken in excess of caloric requirements. Five possibilities arose, any of which might be responsible for the development of obesity: limitation of absorption, elimination, increased mechanical work, combustion (luxus consumption), and finally storage. Energy consumption was determined, not by a supply of energy, but by the margin of tissues, any excess of intake over requirement being stored chiefly as fat. This being true, any continued excess, even if slight, of intake over requirement would eventually result in obesity. In general, body weight might nevertheless remain remarkably constant. Big eaters who led a sedentary life free from worry and with plenty of sleep failed to increase in weight, while others of similar age, sex and height who took only a fraction of the amount of food and led an active life became fatter. The first group were said to have a high luxus consumption. It made no difference from the point of view of energy whether the luxus consumption was high from increased burning of food or from entry storage. Diminished burning of food was frequently associated with a low basal metabolic rate, but increased storage occurred in the majority with a normal rate of metabolism. This storage was apparently due to increased conversion of carbohydrate and of the fat. Glycogen synthesis was apparently linked with this process, while practically all forms of obesity were associated with an increased glycogen formation and not a mere accumulation, as occurred in von Gierke's description. This conception brought endocrinal and nervous obesity into line with nutritional obesity. Endocrinal obesity was roughly divisible into two groups, namely, one with a high sugar tolerance and the other with a low sugar tolerance. Included among those with a high sugar tolerance were patients with hyper-insulinism, those with a deficiency of the diabetogenic and thyrotropic hormones of the pituitary gland, with a deficiency of thyroxin and gonadal secretions. Patients with pituitary basophilism and with excess of adrenal and thymus secretions had a low sugar tolerance. No exact rule was observed, and the quantitative factor was of great

importance. Nervous conditions causing obesity were related to Claude Bernard's classical experiment that first showed a nervous control over glycolytic function in the region of the diencephalon, which apparently was divisible into two parts, affecting the parasympathetic and sympathetic nervous systems respectively, and which had reciprocal relations with the pituitary gland. Neuro-endocrinal obesity was the term applied to those patients in whom both the gland and associated nervous mechanism were affected together. In these the picture was very inconstant and was bound up with the question of water metabolism, while again the quantitative factor was highly variable. There was a common metabolic factor in all patients with obesity which resulted in a common clinical picture, so that the patient was merely fat, whatever mechanism was operating. In other words, it was difficult to discriminate the underlying metabolic error from the clinical appearance of the patient. The differences resembled a physiological variation, with a distribution determined by the inherited pattern of the fat depôts. There existed a developmental obesity in which fat depôts formed part of the architecture of the individual without any tendency existing for weight to increase under ordinary conditions of life.

DR. J. H. ANDERSON (Ruthin Castle) said that the first step in the treatment was to distinguish the type of obesity, exogenous or endogenous or mixed. A careful history should be reinforced, if necessary, by an estimation of the basal metabolic rate, sugar tolerance tests and radiogram of the pituitary fossa. The rational line of treatment in the exogenous group was to reduce the food and increase the exercise. Substitution therapy was called for in the endogenous type, and the mixed group demanded a combination of methods. In treatment four lines of attack were open: two major, diet and exercise, and two minor, drugs and physical treatment. In most cases of obesity, diet and exercise were of paramount importance. Reduction diets varied greatly, and a good one would be found to have reduced carbohydrate, enough to prevent acidosis, and a good deal of protein, providing, if possible, the two to four ounces required to repair the body's daily loss. Fat was strictly rationed, enough being given to carry the essential fat-soluble vitamins. Bulk was essential, and was made up by the use of fruit and vegetables. Exercise should be begun quietly, and the amount prescribed should depend on the condition of each patient. The pulse rate and the blood pressure, before and after exercise, were useful guides in estimating how much was good. Drugs should find their greatest use in endogenous obesity, but, except in some cases due to hypothyroidism, diet and exercise were also necessary. Reduction of diet should be avoided in true hypothyroidism, as the patients stood it badly. In genital obesity, diet, exercise and thyroid gave the best results, and the same three measures were necessary in pituitary obesity, with the addition of whole gland pituitary extract. Drugs, especially thyroid, were controlled by estimating the basal metabolic rate and the tolerance to sugar, and by keeping a watch on the pulse rate. Thyroid medication required especially careful supervision. The patient should be given a limited amount at one time, or he should be made to omit the drug during the last ten days in every month. A dose of one-quarter to one-half of a

grain of thyreoid twice a day was a great help, even in cases of exogenous obesity, in addition to treatment by diet and exercise. Physical treatment increased comfort but had little effect on the weight.

Dr. E. H. STOKES (Sydney) dealt with the association of arterial hypertension with obesity. As a result of the study of one thousand individuals in regard to their body weight and blood pressure, Dr. Stokes was inclined to believe that the relationship between these two conditions was more than coincidental. No other causal factor could be found than that of over-weight among the patients recorded by him. He was prepared to admit that Cushing's work on the pituitary gland might mean that a common cause might be provided by the pituitary for both hypertension and obesity. On clinical grounds deficiency of thyreoid secretion was but rarely responsible for either hypertension or obesity. He considered that the adrenal gland played a more important rôle, and that even if no adrenaline could be found in the peripheral blood of hypertensive patients, the patient might still be sensitized to adrenaline. He did not think that cholesterol could be a sensitizing agent, as a study of the blood cholesterol in the content of the obese failed to show any constant elevation. It would appear that, while obesity was not necessarily caused by hypertension, the causative factors were closely associated.

SIR JAMES PURVES-STEWART (London) dealt with the endocrine aspect only and the relation of this form of obesity to the nervous control of the ductless gland. He classified obesity of this type as follows: (i) Pineal obesity. This type occurred in patients with pineal tumour, but in all such instances pressure occurred on adjacent organs or produced internal hydrocephalus. (ii) Hyperinsulinism. Such persons were frequently fat rather than thin. (iii) Genital: eunuchism in the male and menopausal obesity in the female. (iv) Adrenal, especially in non-destructive tumours of the gland in women and associated with involution of the uterus and adnexa. (v) Subthyreoid, to be diagnosed only when the classical features of obesity were found. (vi) Subpituitary, constituting the commonest form of all, due to a deficiency of the secretion of the basophile cells which were found in the anterior lobe of the gland and sometimes in the posterior lobe. Obesity with dwarfism occurred when the deficiency also affected the acidophile cells of the anterior lobe. The well known Fröhlich syndrome was frequently seen in children with sellar and suprasellar tumours showing characteristic pressure syndromes. Grave doubts existed as to whether this obesity was purely endocrine in origin. It was probably rather neuro-endocrine, as, for example, in the obesity of internal hydrocephalus causing compression of the infundibular stalk. (vii) The Cushing syndrome, due to suprapituitarism of the basophile cells of the anterior pituitary, which was not entirely a secretory disorder. It was frequently associated with the characteristic sign of hyperadrenalism, hyperparathyreoidism and ovarian deficiency.

PROFESSOR R. G. RUDOLPH (Toronto) inquired as to whether the previous speakers had referred to body weight as calculated with or without clothing. Dr. Anderson replied that his figures referred to readings with the patients clad in pyjamas, while Dr. Stokes stated that his patients had been weighed in ordinary clothing.

Dr. S. L. DAWKINS (Adelaide) inquired of Dr. Anderson whether he considered that a patient should change his occupation from a sedentary to a more active existence as an aid to the reduction of obesity. Dr. Anderson replied that as the majority of his patients were over the age of fifty years such a procedure was rarely practicable.

Professor C. G. Lambie was asked to reply to the subsequent speakers and discussed Sir James Purves-Stewart's paper. He was satisfied that fat distribution was of no diagnostic value in elucidating the cause of endocrinal obesity. The real diagnostic points were rather changes in the skeleton, skin, genitals *et cetera*. It was important to pay more attention to the physiological distribution of fat. He stated that following the use of drugs such as

di-nitro-phenol weight might be lost, but the lumps of fat remained in their characteristic sites. He referred further to the question of body weight in patients with hyperinsulinism. While theoretically they should gain, the quantitative factor was such as sometimes to alter this rule. Obesity in diabetes was not always endocrine, but was frequently extrapancreatic in origin; for example, arising in the course of pituitary disease. This had been confirmed by experimental means. With regard to pituitary obesity, he disagreed that obesity was due to deficiency in the gonadotropic hormone, since both genital dystrophy and obesity could appear separately, and because the experimental injection of hormones had been shown by Cushing to cause obesity. Patients with pituitary obesity were frequently characterized by increased sugar tolerance. In support of this he called attention to the fact that the removal of the gonads in many animals did not cause obesity. In some cases of endogenous obesity an increased food intake occurred, probably as a response to a physiological need. Referring to Dr. Stokes's paper, Professor Lambie regretted that he had not correlated patients suffering from obesity and arterial hypertension with their degree of sugar tolerance. Such patients might have a pituitary dysfunction, though Cushing had not been able to reproduce arterial hypertension on the injection of pituitary extracts into dogs.

The Differential Diagnosis and Treatment of Severe Anæmia.

Dr. J. C. MATTHEWS (Downton, England) opened a discussion on the differential diagnosis and treatment of severe anæmia. He suggested that to avoid confusion and to concentrate attention on essentials, the following classification would serve:

1. Pernicious anæmia.
2. Idiopathic hypochromic anæmia.
3. Other deficiency anæmias, for example, scurvy, myxedema.
4. Anæmias characterized by hæmolytic — acholuric jaundice, anæmias due to chemical poisons *et cetera*.
5. Anæmias secondary to: (a) malignant disease, especially of the alimentary tract; (b) infections; (c) hæmorrhage, acute and chronic.
6. Aplastic anæmia.
7. Splenic anæmia.

In discussing the differential diagnosis, Dr. Matthews set himself several questions which he tried to answer.

The first question was: Can a provisional diagnosis be reached by consideration of the history, symptoms, and ordinary clinical signs alone? In discussing this aspect, he said that ordinary clinical data could often carry the differential diagnosis quite a long way. In this regard he discussed pernicious anæmia and said that the position might be stated dogmatically. When anæmia was combined with a very long history, loss of weight (even if only moderate), gross splenomegaly, and/or furred tongue, the condition was not pernicious anæmia. The diagnosis of idiopathic hypochromic anæmia (simple achlorhydric anæmia, chronic microcytic anæmia) from anæmias secondary on the one hand to occult chronic blood loss, and on the other to cancer of the alimentary tract, might be practically impossible on simple clinical examination, but there should be little difficulty in selecting the cases for which X ray examination of the alimentary tract or full hæmatological investigation was necessary. Dr. Matthews also described the prominent clinical features of aplastic anæmia and the conditions covered by the terms splenic anæmia, Banti's disease, and so forth.

Dr. Matthews's second question was: Can the family practitioner advance the diagnosis a stage further without recourse to the expert clinical pathologist? He expressed the opinion that though the student was taught the use of the hæmocytometer and the hæmoglobinometer in the wards of the hospital, the majority failed to attain the degree of dexterity necessary for their satisfactory use. He was surprised that so little use was made of the halometer, for the one outstanding criterion for treatment was the recognition of a megalocytic from a micro-

cytic anaemia. The value and simplicity of the chemical test for urobilin in the urine needed only to be mentioned to be appreciated.

Dr. Matthews's third question was: To what extent is the further information that can be obtained by investigations at the hands of an expert clinical pathologist necessary, not only in determining the exact diagnosis, but also in guiding treatment? His answer was that the investigations of an expert were of the greatest value in both respects. The clinical pathologist was a skilled person, and his experience was particularly valuable in regard to reticulocyte counts, enumeration of blood platelets, differential counts of leucocytes and the recognition of immature forms, and the estimation of the fragility of the red cells.

In conclusion, Dr. Matthews said that there was probably no group of conditions in which a positive diagnosis pointed the way to the appropriate and specific treatment more directly than in the anemias. He discussed shortly liver treatment, the use of large doses of iron, the use of hydrochloric acid and blood transfusion.

Dr. J. H. ANDERSON (Ruthin Castle) briefly reviewed the normal mechanism of red cell development, and with the aid of diagrams illustrated the points where interference would lead to the development of severe anaemia. He pointed out that failure to absorb the anti-anaemic factor in the bowel rendered all medication useless, and that treatment in such cases must be by injection. In his experience, liver was preferable in the acute stages of pernicious anaemia, as pig's stomach could be used orally, but could not be warmed and was more unpleasant to take than liver. Two aims were essential: first, to restore the blood to normal; secondly, to keep it there, or even above normal, especially if the symptoms of subacute combined degeneration of the cord were present. In conclusion, Dr. Anderson said that when treating any patient with pernicious anaemia the following points must be carefully adhered to. The diet should be generous and abundant in vitamins. The stomach or liver extract should be of proved potency and should be pushed until the responses became evident, and then continued until the blood count was normal or above normal. If infection occurred or the blood showed signs of a relapse, the maintenance dose should be increased forthwith. Intramuscular injection was a good plan at first, as it brought the patient up for inspection; maintenance should be continued for the remainder of the patient's life. Iron was needed if the colour index fell below unity, but hydrochloric acid only if digestive disturbance or glossitis was present.

Dr. C. T. C. DE Crespigny (Adelaide) discussed those patients with megalocytic anaemia who were found to be resistant to liver therapy. He selected two such patients for description, illustrating his remarks by diagrams of the progress and changes in the blood count, in serological tests and haemoglobin estimations. The first patient was a male, aged thirty-five years, who became anaemic and lost weight for eight months before he came under observation. He had been treated for five months by liver preparations both orally and intramuscularly without improvement. The chief abnormality, in addition to the usual features of a severe anaemia, was an enlargement of the liver. His blood film showed a megalocytic anaemia, but immature red cells were of a greater diameter than was usually found. The red cells differed considerably in their fragility, some being more and others less fragile than the normal. Free hydrochloric acid was absent from all specimens of the fractional test meal, even after histamine stimulation. The Van den Bergh test showed a positive indirect reading. The patient received three separate transfusions, each of a pint of blood, within eight days, together with further intramuscular injections and liver, but a week later developed an infection of his antrum, which caused his death six weeks later. Unfortunately no autopsy was permitted. The second case was described on account of the very long duration of the megalocytic anaemia. The patient was a female, aged fifty-six years, who had been constantly anaemic for eight years at the time when she presented herself for treatment in 1927. Her condition

showed little variation until her death in 1934. No form of treatment produced any great or lasting improvement in the blood. Dr. de Crespigny concluded that there was a rare form of anaemia in which a megalocytic state of the blood might persist in a remarkably chronic form. It was insusceptible to improvement by any known treatment except transfusion and, although this might suffice to keep the patient alive, it was without any lasting value. The cause of this anaemia remained obscure.

Dr. J. CLARKE BEGG (Swansea) discussed pitfalls in the diagnosis of pernicious anaemia, especially those into which the general practitioner, and even the consultant, might fall, rather than those confronting the haematologist. One should remember that pernicious anaemia had an insidious beginning, so that even a full blood examination at an early stage might yield inconclusive results. Again, remissions under modern treatment might be so complete that without the history examination might fail to disclose the condition. The chief difficulty was that pernicious anaemia was often strongly suggestive of primary disease in other systems than the blood, especially the gastrointestinal system, the nervous system and the circulatory system. Dr. Begg illustrated these difficulties by reference to cases in which they had led him or others astray. The first patient quoted had actually lost considerable weight, which led to the conclusion that malignant disease was present, yet blood examination revealed typical pernicious anaemia. In another patient the tongue was furred and symptoms pointed rather to gall-bladder disease. A further patient, a male, complained of numbness of the legs which was diagnosed as neuritis, and much valuable time elapsed before investigation showed that he was suffering from subacute combined degeneration of the cord. It was easy to overlook pernicious anaemia in a neurotic female complaining of every imaginable ache and pain, while a diagnosis of myocardial degeneration was common in patients subsequently found to be suffering from a primary anaemia. Dr. Begg realized the practical impossibility of performing a full blood examination upon every patient with doubtful symptoms of anaemia, but the difficulty could be largely overcome by the use of Eve's halometer. If the halometer reading indicated megalocytosis or was in the doubtful zone, further investigation of blood and gastric secretion should be carried out. If the cells were shown to be normal or less than normal in size, pernicious anaemia was extremely unlikely to be present. He made a plea for the more frequent use of this instrument before patients were involved in the expense of more elaborate investigation.

Dr. IAN WOOD (Melbourne) discussed the subject from the viewpoint of the condition of vital organs which might follow severe anaemia, especially from traumatic blood loss. It was necessary to view the body as a whole and to consider the far-reaching effects of deprivation of haemoglobin blood proteins, lowered blood pressure and circulation rate upon liver function, renal function, muscular strength and cerebral coordination. From observations in Melbourne he had found that if the blood haemoglobin remained for long at or below 20%, renal failure became evident. He advocated the rapid reestablishment of blood values by large blood transfusions given by the continuous drip method, as advocated by Marriott, of Middlesex Hospital. He illustrated the subsequent fall in blood urea which occurred after restoration of the haemoglobin value to 80% or more. Great care was necessary in blood transfusion to avoid a reaction resulting from the deposit of acid haematin in the renal tubules, which was capable of causing death within five to seven days after the operation. Prophylactic and curative treatment was possible by the use of large doses of alkali given orally. Severe anaemia was a medical emergency, and every hour was important in order to save life.

Dr. EVA SHIPTON (Sydney) continued the discussion from the viewpoint of the haematologist. After enumerating the various procedures which were required for a complete blood examination, Dr. Shipton added a warning against the diagnosis of pernicious anaemia in the presence of free hydrochloric acid, and said that in adoption of a

terminology the diameter as well as the volume of the red cells should be considered.

Dr. G. N. KERSLEY (Bath) concerned himself with two types of anaemia which were common and curable by the exhibition of iron. The first type was the nutritional anaemia of infancy which occurred at or after the age of six months in infants whose food had been deficient in iron. The second type was the group of anaemias of pregnancy, especially the microcytic form which occurred during the last three months of gestation, at a time when the foetus was draining considerable iron from the internal reserve, aggravated by a deficient absorption of iron associated with the acquired hypochlorhydria of pregnancy. Symptoms were insidious and atypical, but if unrecognized and untreated the patient was liable to suffer from severe *post partum* shock, which might prove fatal. Massive doses of iron were invariably successful, but a transfusion should be given if any tendency towards marrow aplasia could be detected.

Dr. GUNARATNAM COOKE (Ceylon) said that the chief anaemias in his country were associated with hookworm infestation, in the course of which the blood picture sometimes changed from the secondary to the primary type. He had found combined treatment with liver and iron to be very valuable. He stated that the complex terminology of the modern haematologist was most confusing to his countrymen, and he himself was content to call pernicious anaemia "large red cell anaemia".

Dr. Matthews, in reply, said that his "examination paper" had not been answered, but many other interesting questions had been raised.

Diabetic Gangrene.

Dr. A. CLARKE BEGG (Swansea) read a paper on diabetic gangrene. He said that the underlying cause of the condition was twofold or perhaps threefold: (i) arteriosclerosis, (ii) increased susceptibility to sepsis, (iii) diabetic neuritis. In regard to the causation of arteriosclerosis by diabetes, although hyperglycaemia might have a considerable influence, it was probable that disordered fat metabolism associated with an excess of cholesterol in the blood was the most important factor in the causation of diabetic arteriosclerosis. Arterial occlusion alone might be sufficient to cause gangrene, but in most cases there was a superadded infective element. The actual onset was determined by slight trauma allowing the entry of organisms, which acted on the devitalized tissues and caused gangrene.

Dr. Begg discussed preventive and curative treatment. He thought that something could be done to prevent the onset of arteriosclerosis in diabetics or to delay its development. In addition to the general measures prescribed for any patient whose cardio-vascular system was threatened, an effort should be made to keep the body weight at or slightly below normal, and the food metabolism should be kept as nearly normal as possible. The important thing was that all diabetics should be treated efficiently. When signs of arteriosclerosis had appeared, the maintenance of a good circulation in the legs should be encouraged and meticulous care should be taken in keeping the feet clean.

When gangrene had appeared, it might be most difficult to decide on the right course of treatment. If the gangrene was moist, spreading, with infiltration and necrosis of tissues, accompanied by foul odour and general constitutional disturbance, amputation should be performed as soon as the patient could be prepared for operation. If gangrene was definitely dry, with little or no constitutional disturbance, conservative methods were clearly indicated. The real difficulty was with cases that did not fall into either category. Undoubtedly the common fault was in delaying operation too long, but legs were sometimes needlessly sacrificed. The two factors to be considered in arriving at a decision were the degree and amount of sepsis and the condition of the circulation of the leg. If a decision to wait was made, the patient should be kept in hospital under strict observation. Sometimes rest in the horizontal position would encourage drainage; in Dr.

Begg's experience this had sometimes turned the scale. It was difficult to say how long one should persevere with conservative treatment if progress was unfavourable. While it was impossible to lay down any general rule, Dr. Begg thought that conservative treatment should be abandoned after three or four weeks, unless there were definite signs of improvement.

Dr. J. C. MATTHEWS (Downton) emphasized the great practical value of Dr. Begg's paper. He wished to point out the usefulness of the aneroid capsule attached to a sphygmomanometer band applied at varying levels along the affected limb as a means of estimating the degree of arterial obstruction. He stated that normally it was usual to find a deflection of the needle of six millimetres in the centre of the calf in a healthy individual, but considerably less in the diabetic with early gangrene. He warned his hearers against waiting for a line of demarcation to appear, and as a means of preventing gangrene in the amputation flaps he advised thorough biochemical control and insulin treatment both before and after operation.

Dr. M. D. SILBERBERG (Melbourne) referred to the association which appeared to exist between arteriosclerosis and disorder of the cholesterol metabolism. He considered that it was most important that the affected limb should be kept thoroughly dry by the use of methylated spirit and the employment of dry heat from electric light bulbs under a cradle. He preferred eusol as an antiseptic if any infection was present. He stated that gangrene of a soft tissue was a danger in diabetes equal to that of gangrene of the extremities.

Dr. KEMPSON MADDOX (Sydney) made a plea for early amputation above the knee in patients with established diabetic gangrene, so as to allow them to walk early on a peg stump, especially in those patients who were elderly and of poor social position, since the expectation of life in general was so short. He agreed with Dr. Matthews as to the great value of the Pachon oscillometer, but was satisfied that a careful history and the simple postural tests of Pickering gave all the information required. With regard to operation, the danger was rather the result of associated arterial disease in the heart, kidneys or brain than of death from diabetic coma.

Dr. E. COOPER (Melbourne) praised the weak tincture of iodine as an antiseptic for diabetic patients with infected feet. There was great danger of inducing gangrene of soft tissues away from the extremities by the use of strong antiseptics. He had obtained considerable help in the diagnosis of arterial disease from the observation of the conditions of the retinal arteries. In almost every case of diabetic gangrene extensive degeneration was visible in the fundi. Every case of gangrene was not necessarily diabetic in origin. Sometimes glycosuria and ketosis were secondary to toxæmia arising from an infected extremity.

Dr. Clarke Begg stated that his intention was to emphasize the preventive aspect of the subject.

Familial Acholuric Jaundice.

Dr. S. O. COWEN (Melbourne) read a paper on the treatment of familial acholuric jaundice. He based his remarks on thirty-three patients with the disease who had come under his notice. Seventeen of the cases had occurred in the members of the Hazel family. Certain members of this family had been described by Springthorpe in 1904. In addition to the members of the Hazel family, sixteen other patients suffering from familial acholuric jaundice, representing eight affected families, had come under his care. Of the thirty-three patients, twenty had been subjected to splenectomy. There was no operative mortality and the operative morbidity was negligible. Regarding the indications for splenectomy, most authorities stated that splenectomy should not be advised unless the symptoms were sufficiently severe to cause definite incapacity. This attitude was justified by the fact that the disease, even if it was untreated, was often compatible with long and useful life. On the other hand, the occurrence of severe, sometimes unexpected and occasionally fatal hæmolytic crises, together with the difficulty and danger of the opera-

tion in older patients, supported the view that splenectomy should not be long delayed when once the diagnosis had been made. The results of operation in Dr. Cowen's series bore out the general statement that the relief afforded by splenectomy was permanent. In seven of the twenty patients operated on, pigment gall-stones had been found. When biliary pigment stones were present, the gall-bladder should be emptied by crushing the stones digitally or by cholecystotomy. Cholecystectomy should be performed only when evidence of cholecystitis was present.

DR. C. T. C. DE CRESPIGNY (Adelaide), who had known some of the early patients included in the family tree described by Dr. Cowen, asked whether splenectomy cured the tendency to ulceration of the legs, to which some of these patients were liable. He also referred to the blood crises which form a part of the disease, and asked whether any of these had been observed following the operation.

DR. G. COOKE (Ceylon) stated that in Ceylon the question of splenectomy was complicated by the frequent coincidence of malaria, and that following splenectomy left-sided pneumonia, which was frequently fatal, or pleural effusion was a common occurrence.

In reply, Dr. Cowen stated that ulceration of the leg had occurred in two of his series and had disappeared after splenectomy. He was grateful to Dr. Cooke for his remarks, and was satisfied that the pulmonary complications, since they always occurred on the left side, were the result of local operative injury.

Gallop Rhythm.

DR. CRIGHTON BRAMWELL (Manchester) read a paper on gallop rhythm and the accentuation of the physiological third heart sound. Dr. Bramwell emphasized the importance of distinguishing presystolic from protodiastolic gallop, since the former was a sign of very grave significance, whereas the latter was compatible with perfect health. In a consecutive series of 63 cases, which had in turn been culled from a consecutive series of 1,353 cardiac patients seen by him in private practice, only 15 patients lived for more than eighteen months after the gallop was first noticed. Gallop might occur in association with essential or other types of hypertension, with coronary arteriosclerosis or with acute inflammatory lesions of the heart. It developed only in patients with normal sinus rhythm and tachycardia, and disappeared if auricular

fibrillation supervened. Presystolic gallop appeared to be due to sudden distension of the ventricle at a time when the ventricular muscle was lacking in tone. This was attributable to an increased rate of ventricular filling, when, owing to tachycardia, the auricle contracted early in diastole. There was no evidence that bundle branch block or partial heart block could give rise to a presystolic gallop. Protodiastolic gallop was due to accentuation of the physiological third heart sound. It could be distinguished from presystolic gallop by the absence of any associated palpable impulse and by the unequal spacing of the sound. An accentuated third heart sound was generally audible in mitral stenosis, but presystolic gallop never developed in patients with this lesion, probably because auricular fibrillation intervened first.

DR. ARBOUR STEVENS (Swansea) differed from Dr. Bramwell concerning the physics by which the sound oscillation was produced. He stated that muscle produced no sound on contraction and that the cause, in his opinion, was actual oscillation of the pericardial fluid. He had been able to show that the negative pressure normally existed in the pericardial sac, which altered on the appearance of cardiac failure, allowing the heart to move more freely and so to alter in sound. He drew attention to the alteration in volume and quality of the heart sound which might occur when a stethoscope with a very large bell was applied to the chest. The normal sounds resembled each other very closely under such conditions, especially if the pericardial lubrication was deficient. He thought that it was possible that gallop rhythm occurred when the serous exudations of the body were disturbed.

DR. M. LIDWILL (Sydney) asked Dr. Bramwell why protodiastolic rhythm became mesodiastolic and ultimately presystolic as the patient's condition grew worse. His experience of gallop rhythm was confined to a very small area of the precordium.

Dr. Bramwell replied. He agreed with Dr. Stevens that the heart sounds were altered considerably by the size of the stethoscope, and stated that to appreciate gallop rhythm best, direct auscultation of the chest wall without a stethoscope allowed the double impulse to be appreciated as well as the double sound. The impulse itself was felt just to the left of the xiphisternum. He could not explain why the additional sound should change its position in diastole, but reminded Dr. Lidwill that the gallop element might completely disappear as the heart slowed in rate.

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Hydatid Disease.

PROFESSOR H. R. DEW (Sydney) opened a discussion on the advances in the knowledge of hydatid disease during the twentieth century.

After pointing out that in spite of the extensive clinical experience of Australian physicians during the last decade of the nineteenth century, when hydatid disease reached its highest incidence in Australia, there still remained many puzzling facts which could not then be explained, Professor Dew, using lantern slides, showed how these various problems had been attacked and all those of prac-

tical importance solved. After each general advance was dealt with he indicated as a guide for the discussion what problems remained to be elucidated. *Ætiology* was shortly dealt with, and the hope was expressed that the Registry of Hydatid Disease of the Royal Australasian College of Surgeons would help to further the knowledge of this aspect. The importance of Dévé's work on secondary echinococcosis and the way in which it had led to a fuller understanding of the pathology of the disease was demonstrated at some length, as it was the most valuable single addition to knowledge. Other advances in knowledge of the pathology of the disease as it affected special organs

were indicated and, after making an appeal for further observations, particularly on incidence, complications, and the occurrence of pathological variations, Professor Dew dealt shortly with diagnostic methods. Under this heading the importance of the advent of radiography was emphasized and the suggestion was made that still further observations on such aspects as the rate of growth of cysts and the diagnosis of deeply placed cysts were needed. Attention was drawn to the great value of the various immunological tests; their relative importance was considered, while emphasis was laid on the fact that still further observations, both clinical and experimental, were necessary in order to assess their relative value.

Under the heading of treatment the great contribution of Australian surgeons was referred to and attention was drawn to such problems as were presented by cysts which had invaded the biliary passages, the deep-seated pulmonary cysts, cerebral cysts, cysts of bone, and the more or less hopeless secondary cysts of serous cavities. In concluding, Professor Dew stated that although in Australia knowledge of hydatid disease was second to none, there was no excuse for complacency, and that, as Australian observers had an unrivalled opportunity for its study, they were expected to do what they could to add to knowledge of the subject.

DR. B. KILVINGTON (Melbourne) discussed the important and rather neglected group of calcified hydatid cysts. The adventitia after some time thickened, more especially in the liver, and in it lime salts might be deposited. The X ray appearances were characteristic. These cysts were usually, but not always, dead, and occasionally contained live daughter cysts. Occasionally degenerated cysts also contained lime salts which had been deposited in the membranes themselves following caseous change. Calcification had been present in 78, or 23%, of the 342 cases of hydatid disease occurring during the past ten years at the Melbourne Hospital. Of all cysts, 70% occurred in the liver, but of calcified cysts 67, or 86%, were in the liver. Calcified hydatid cysts usually caused no trouble unless they became infected. They were found by accident at X ray examination, operation or autopsy. In the present series, 36, or 46%, were so discovered and were symptomless. Of the series, 5% showed a positive response to either the Casoni or complement fixation test, though these might be due to other and living cysts. Treatment of hydatid disease was, when possible, closure of the adventitia after evacuating the cyst content and swabbing the lining with formalin. Discomfort and delay in convalescence were so avoided. With infection, drainage was, of course, essential, but, owing to the non-collapsible nature of the cyst, might go on indefinitely. Another method of treatment which Dr. Kilvington had carried out twice with success was to evacuate and formalinize the cyst and crush the adventitia. This separated later and was removed with forceps six weeks afterwards. This appeared to be the only method of shortening the indefinite discharge resulting from the customary treatment by simple drainage.

PROFESSOR D. W. CARMALT JONES (New Zealand) discussed the life history of the *Tania echinococcus*. He pointed out that a primary cyst acted as a benign tumour, producing pressure effects only, if any. It obtained its nourishment from the host, the walls being pervious, and in the early stages enough material often passed out of the cyst to sensitize the host's tissues and give a positive skin reaction. The fibrous adventitia, derived from the host, might become so thick as to starve the cyst, which then died, and the adventitia might become calcified. The record primary cyst contained twenty-two pints of fluid. If a cyst wall was injured, the life of the parasite might be preserved by the development of daughter cysts of similar structure to that of the primary cyst, probably by cystic transformation of the scolices. Such a cyst was very much like a malignant tumour, for the reason that it might produce untoward effects as a result of rupture. In addition to pressure effects, the two grave risks of hydatid disease were suppuration and anaphylaxis.

DR. HUGH R. G. POATE (Sydney) discussed the intra-biliary rupture of hydatid cysts. This was more common than was commonly thought, and was always of interest, as the true nature of the case was generally unsuspected until the patient came to operation. It was worthy of note that Dew believed that it was the most common complication of hepatic cysts. Erosion of and leakage from some of the smaller bile ducts surrounding the cysts might occur. *Débris* might find its way into these ducts, and partial or complete blockage at the ampulla of Vater, with consequent jaundice, might occur. Pain was not usually so severe as with the ordinary gall-stone attack, and as a rule patients were much younger than the average age for gall-stones. In an otherwise healthy young adult recurring attacks of mild jaundice, perhaps with some pyrexia, should arouse suspicion of hydatid disease. Dr. Poate felt that the possibility of natural cure was so remote and the probability of septic complications so great that if the diagnosis was made or the condition even suspected, early operation should be undertaken. He described the operation of drainage, but said that occasionally it was impracticable to drain a very deeply situated cyst by direct approach. In these circumstances it should be cleared as far as possible by way of the common bile duct, after which a small tube should be passed up to it through the duct, the free end being brought to the skin surface through a lumbar stab wound. Following this, syringing with saline or weak iodine solution effectively cleared any remaining *débris* in seven to ten days.

DR. S. C. FITZPATRICK (Hamilton, Victoria) said that he practised in a district of heavy incidence of hydatid disease and had seen eighty-seven cases. He devoted his discussion particularly to pulmonary cysts. He said that it would be expected that in a homogeneous medium growth should be equal in all directions. This did not occur and Dr. Fitzpatrick discussed the factors which determined the direction of growth, these being principally the relation of the growth to the bronchial tree and to the pleura. It seemed that these factors were of some importance and he suggested that the elongation of an "unemerged" cyst indicated that part of its surface had reached the interlobar fissure; that an "emerged" cyst would show flattening on its parietal aspect; that a secondary pleural cyst would show elongation parallel to the ribs (or intercostal spaces) immediately external to it; that an intramuscular cyst would show elongation parallel to the muscle fasciculi. Dr. Fitzpatrick next referred to the treatment by means of artificial pneumothorax, by which five carefully selected patients with ruptured parabronchial cysts were treated. Three of these lost their sputum and their recurrent hæmoptysis, gained weight and returned to work much sooner than if no such treatment had been given. Probably only a small proportion of patients were suitable for artificial pneumothorax treatment, but it appeared to have a definite value in carefully selected patients who were free from pleural adhesions.

DR. KEITH D. FAIRLEY (Melbourne) discussed the laboratory diagnosis of hydatid disease. Eosinophilia was useful only as suggesting investigation by more specific tests. The precipitin test closely paralleled in its results the complement fixation test, but minor reactions were difficult to interpret. The complement fixation test was specific, but failure to react was of no value in excluding hydatid disease. The results were positive in only 54% of pre-operative tests with primary or recurrent or residual cysts. The fixation of six or more minimal hæmolytic doses of complement suggested that some complication had occurred in the cysts. Within two or three months after operation the serum might fail to react to the test. The fixation of six minimal hæmolytic doses of complement nine months after operation suggested the presence of residual cysts, as also the fixation of three minimal hæmolytic doses more than two years after operation. The chief value of the test was in the diagnosis of primary suppurating or ruptured cysts and of residual recurrences. Since some patients reacted with this test, but not with the intradermal test, both should be employed in the pre-operative diagnosis of primary cysts. In regard

to the intradermal test, the delayed reaction should always be looked for, as occasionally a positive result might appear when the immediate reaction failed to develop. The immediate reaction was of great value in the pre-operative diagnosis of primary cysts, but was of no help whatever in the diagnosis of recurrent or residual cysts. Repeated injections of the same field might sensitize the skin in this locality and lead to fallacious results. In primary pre-operative cases a positive result was obtained in approximately 75% of those with uncomplicated or degenerating and degenerated cysts. After operation the reaction was almost invariably positive, and usually remained so for many years. Results showed that after the primary operation a negative result might suggest but did not prove cure, while a positive result was of no significance in the diagnosis of recurrent cysts. The high incidence of latent cysts (1.6%) discovered at autopsy necessitated *post mortem* proof of the absence of hydatid infestation when an apparently fallacious positive result was obtained. One of the chief values of the test was in excluding hydatid infestation. Over some 2,000 cases a negative response had correctly indicated the absence of hydatid disease in 95%.

DR. A. J. TRINCA (Melbourne), DR. H. B. DEVINE (Melbourne), DR. BALCOMBE QUICK (Melbourne), and DR. JENKINS (Dunedin) spoke against the injudicious use of formalin.

DR. MURRAY MORTON (Melbourne) said that formalin should come in contact with the parasite only and should not be left in the cyst cavity.

SIR THOMAS DUNHILL (London) thought that something better than formalin might still be discovered. He stressed the fact that the hydatid cyst was in general an innocent tumour and that there was no urgency about operation unless complications ensued.

Professor Harold R. Dew, in reply, agreed with Dr. Kilvington that calcified cysts should be left alone as long as possible. He again drew the attention of the meeting to the Registry of Hydatid Disease being kept by the Royal Australasian College of Surgeons. While he was in complete agreement with Dr. Poate in regard to the treatment of rupture into the biliary passages, he said that too much interference with a sick patient might have fatal results. Formalin was being used too strong, in too large quantity, and too much was being left behind. A cyst four inches in diameter required six cubic centimetres of commercial formalin to produce the necessary 1.5% solution. Formalin was almost useless with multiple daughter cysts. Saline solution must be put in before closure. The presence of air predisposed to mild infection.

Surgery of the Pancreas.

DR. HAROLD UPCOTT (Hull) opened a discussion on surgery of the pancreas. He began by saying that it was desirable that surgeons should survey the limits of their art in the treatment of pancreatic disease. In regard to acute pancreatitis, he said that certain facts emerged from the experiments carried out to explain the pathology of the disease: (i) acute oedema of the pancreas followed the injection of bile into the pancreatic duct; (ii) if the injection was combined with damage to the acinar cells, as by injection under pressure or by some other means, the ferments were activated and acute necrosis occurred. In a certain proportion of cases the terminal bile and pancreatic ducts were so disposed that an obstruction of the common orifice would allow the entry of bile into the pancreatic duct. In spite of the fact that in some cases of acute pancreatitis no disease of the gall-bladder or ducts could be demonstrated, it was generally agreed that acute pancreatitis was caused by an infection, of which the biliary tract was the usual source, and that it owed its peculiar character to the activation of trypsinogen within the gland. It was usual to recognize three types of acute pancreatitis: hæmorrhagic, gangrenous and suppurative. There was also a milder inflammation, which had been described as acute pancreatic oedema.

Dr. Upcott described the symptoms of acute pancreatitis and said that, though they were so characteristic, most of those present had probably made incorrect diagnoses. He mentioned the tests that might prove useful in diagnosis, but pointed out that, with the exception of Loewe's test, their performance was too lengthy for them to be of much use in so urgent a condition. The recognized treatment of acute pancreatitis was early operation. Dr. Upcott described shortly the main procedures adopted and said that most patients who recovered after operation remained in good health and free from symptoms if the gall-bladder and ducts had been surgically treated.

The cases of chronic pancreatitis with which the surgeon had to deal were usually related to disease of the biliary or gastro-intestinal tract, or associated with tumours or calculi in the gland itself. The symptoms were vague, but the constant boring pain, deep in the upper part of the abdomen, should direct the surgeon's attention in this direction. Dr. Upcott discussed the tests that might be used; some of them he described as of doubtful value; and he seemed to prefer the diastase reaction of the blood. The principal difficulty in diagnosis, he thought, was the distinction between chronic pancreatitis and cancer of the pancreas, particularly when constant jaundice and a palpable tumour were present. Even at operation it was not always easy to decide. The surgical treatment of chronic pancreatitis was essentially drainage of the biliary system, either by establishing a temporary external fistula from the gall-bladder or common duct or by diverting the bile from the gall-bladder into the stomach or duodenum. Dr. Upcott discussed the operative treatment and said that the fibrosis of the head of the pancreas might cause such constriction of the duodenum that gastro-enterostomy was required. He then referred to pancreatic cysts and classified them into four groups: (i) retention or canalicular cysts, (ii) neoplastic cysts, (iii) pseudo-cysts, (iv) parasitic cysts. In regard to pancreatic fistule, the suggestion had been made that they should be dissected out and implanted into the stomach.

Malignant disease of the pancreas was almost always carcinoma. The symptoms often resembled those of chronic pancreatitis, and early diagnosis was difficult or impossible. Later on, the presence of a hard fixed tumour might declare itself, and survival of the patient to this stage was more likely to happen when the growth was in the body or the tail of the organ. If the diagnosis was confirmed at operation, the simplest method of diverting the bile should be practised.

Dr. Upcott concluded by referring to affections resulting from alteration in the internal secretion. In regard to increased secretion, he described the symptoms of the hypoglycæmic state, and pointed out that, if all the other causes of the hypoglycæmic state could be reasonably dismissed, it appeared justifiable to advise exploration of the pancreas, for in no other way could the presence of an adenoma of the cells of Langerhans be determined.

DR. F. C. PYBUS (England) first emphasized the almost constant association of pancreatitis with biliary infection. After gall-bladder operation patients occasionally experienced pain, a rise in temperature, and jaundice due to mild pancreatitis, which usually subsided without trouble. Occasionally the attacks occurred with sufficient frequency and severity to suggest the recurrence of the stones. Only one phase of the condition was seen during operation, so that it was unreasonable to describe what was seen as a particular type of pancreatitis. All types might be different stages of a similar infection. The symptomatology varied greatly according to the stage at which the patient was seen and the severity of the infection. There was no one clinical picture. The first symptom was pain, commencing in the epigastrium and radiating to the right or the left subcostal region, or both, according to the part of the pancreas involved. It was sometimes referred to the back or to the subscapular region on either side. It was of great importance in determining the amount of pancreatic involvement. Epigastric tenderness was present, but there was no rigidity. There was fever. Jaundice was variable. Specific tests were of little use, as the degree of pancreatic destruc-

tion varied enormously. The chief difficulty in diagnosis was to distinguish the condition from cholecystitis and perforating peptic ulcer. Dr. Pybus agreed with Dr. Upcott on the subject of treatment. He was doubtful whether incision and drainage were worth while. If he could make the diagnosis with any degree of certainty, he preferred to leave the patient alone and to deal later with any abscess that might develop.

Dr. BALCOMBE QUICK (Melbourne) discussed the frequency of acute pancreatitis. There was an extraordinary disparity between its incidence at the Melbourne Hospital and at the Johns Hopkins Hospital, Baltimore. The apparently higher incidence in Melbourne was almost certainly due to a more general recognition of the disease, and this was the result of the great interest taken by the staff. Errors in diagnosis were most commonly due to failure to recognize that the possibility of its presence existed. The cardinal points in the clinical syndrome were pain, vomiting and tenderness. A careful consideration of the pain was of great assistance. Estimation of the urinary diastase was of definite help. Following the use of this test the pre-operative diagnosis of the condition at the Alfred Hospital had risen from 30% to 100%. Absolute abstinence from all feeding by mouth was of great importance in treatment. Seeing that treatment without operation gave the best results, the diagnosis must be made without possibility of error. Even with the fullest consideration some cases were excessively difficult to distinguish.

Dr. Harold Upcott, in reply, again referred to the desirability of avoiding operation. This could be justifiable only if the diagnosis was a certainty. He was indebted to Dr. Balcombe Quick for the information about the diastase test. He thought that the explanation of the disparity between the figures at the Alfred Hospital and at the Johns Hopkins Hospital was that the figures in the latter instance had been taken from the hospital statistics for the last fifty years, and in the former for the last ten. Diagnosis of recent years was much more accurate, and if the Johns Hopkins Hospital figures for the last ten years were available they would very probably correspond to Dr. Balcombe Quick's figures from the Alfred Hospital.

Prostatectomy.

Dr. A. CLIFFORD MORSON (London) opened a discussion on the subject of prostatectomy. He began by giving a brief outline of the history of the operation. There had been, he said, three periods in its development. The first was inaugurated by Freyer in 1901, the second by Thomson-Walker and Judd in 1916, and the third by Harris. He made brief reference to trans-urethral resection, and added that until the pathology of diseases of the prostate had been clarified it would not be possible to assess the true value of any kind of electrical treatment. There was some difference of opinion as to whether the whole prostate was removed. Thomson-Walker had maintained that the wall of the prostatic bed was formed by the thickened retro-vesical fascia and that any prostatic tissue found in it was accidental. Cuthbert Wallace, on the other hand, claimed that the diseased tissue removed was adenomatous and did not contain any gland tubes. According to the latter view, prostatectomy was a misnomer for the operation of enucleation. Dr. Morson's observations supported Cuthbert Wallace's findings.

It was necessary to stress the importance of the eradication of the whole of the diseased portion of the gland if the patient was to be permanently cured. Recurrence of prostatic enlargement was a demonstration of failure on the part of the surgeon who had performed the operation. The changes that occurred in the bladder and urethra during the period of post-operative convalescence varied according to the operation performed. By the Freyer and Thomson-Walker methods the prostatic cavity after enucleation was left bare of mucous membrane and no attempt was made to unite the bladder to the torn end of the urethra. Eventually this union occurred by what might be termed secondary intention. Harris, on the

other hand, claimed that he obtained union by first intention. The difference between healing by secondary and primary union was in the amount of fibrous tissue that formed. In primary union a thin scar was observed, which, as it grew older, might be difficult to find. A scar formed by secondary intention was a disfigurement and often led to interference with function. With the introduction of the Thomson-Walker technique stone formation had become a rare complication, but post-operative urethral obstruction still occurred.

Turning to the subject of the Harris technique, Dr. Morson said that Harris reconstructed the internal meatus. This insured more rapid healing and, by preventing urine from coming into contact with tissues uncovered by mucous membrane, reduced sepsis. The post-prostatic pouch was obliterated by drawing down the base of the bladder to the level of the bed of the prostate with the aid of catgut sutures. Cysto-urethroscopy during the convalescent period showed that the new internal meatus was on the same plane as the interureteric bar. There was thus no opportunity for urine to stagnate in the region of the ureteric orifices. Because of successful hæmostasis it was possible to close the bladder without suprapubic drainage. In about 50% of Dr. Morson's cases there was no leakage of urine through the abdominal wall. Dr. Morson said that he had investigated the site of operation by means of the cystoscope and urethroscope after operation. If at the operation there had been failure to unite the trigonal flap to the torn end of the urethra, scar tissue formed, and the amount of scar tissue was dependent on the extent of separation. In Dr. Morson's cases this had varied from half a centimetre to one millimetre. It was surprising how slowly this raw area became covered with scar tissue. The lapse of time was anything between the twenty-first day and the sixth week after operation.

Regarding the advantages of the Harris method, Dr. Morson agreed with Harris that there was complete and immediate control of hæmorrhage by suture. He could not agree that Harris's technique, as described in *The British Journal of Surgery*, always obliterated the prostatic cavity. The post-operative recurrence of obstruction was definitely obviated.

Dr. Morson described some "minor modifications" of the Harris method which he believed were necessary. He suggested that Harris performed the principal part of the operation without direct illumination. He (Dr. Morson) had devised an electrically lit retractor which illuminated the prostatic cavity and which, he said, was an improvement on all others in that the blades were fenestrated and the posterior retractor was so curved as to prevent bulging of the wall in front of the pouch of Douglas. He had altered the anterior retractor used by Harris so that it could carry an electric bulb on the end of it. For accurate observation of the prostatic cavity he had designed a new instrument which he called a prostatic speculum. The blades of this instrument were inserted into the prostatic cavity and could be separated. Perfect visibility of the tissues forming the bed of the prostate was thus obtained. Dr. Morson enucleated the prostate by the intraurethral method, but without a finger in the rectum. Harris maintained that by his technique the mucosal covering of the prostatic urethra remained intact. Dr. Morson said that there had been failure to support this claim. Dr. Morson also described a figure-of-eight suture which, he claimed, obviated some of the disadvantages of Harris's transverse suture.

In the last section of his paper Dr. Morson discussed the avoidance of certain complications. He referred *inter alia* to the safeguarding of the seminal vesicles. He attempted to sterilize the seminal vesicles as well as the urethra, before enucleation was commenced, by irrigation via the proximal end of the divided *vas deferens*, with a 1 in 60 solution of carbolic acid.

Dr. JOHN TAIT (Melbourne) discussed technique. His aim had been to develop a technique applicable to all types of case. He always relied on suturing for the control of bleeding, and was indebted to Harris for his introduction of the boomerang needle and holder. He had

never used Pilcher's bag. In a few cases he had been forced to pack the prostatic cavity, but he had regretted it. There was a certain type of patient—the short, stout type with a protuberant abdomen—in whom it was impossible to introduce the sutures accurately, as the prostate was down behind the pubes and difficult to expose. He felt that the sutures themselves were the cause of secondary hæmorrhage and that another factor was complete closure of the bladder. He kept the bladder open till after the fourteenth day. He had had one case of fatal hæmorrhage due to the use of suction drainage immediately on the patient's return to the ward. This should not be done. There was a risk of the pocketing of septic material under the flaps in the prostatic cavity, as evidenced by tenderness and swelling in the region of the prostate on rectal examination. Finally, Dr. Tait said that vasoligation should be carried out as a routine measure, and asked at what stage this could be most suitably done.

DR. FRANK MACKY (Auckland) discussed the recent enthusiastic adoption of transurethral prostatic resection. One reason for this was the undue delay in the recognition of Harris's work. He was absolutely convinced of the merit of this operation, but it should be reserved for suitable cases. Resection should be carried out only on patients who were not suitable for Harris's operation. All the trouble he had had was due to not following Harris's instructions. In the avoidance of sepsis it was essential to keep to the mid-line and to make the incision reasonably small. Even after suprapubic drainage over periods of months a Harris operation with complete closure was still technically possible. Prostatectomy was now a good, surgical, safe operation, but it would be desirable if patients reported earlier for surgical treatment.

DR. G. H. BURNELL (Adelaide) had found blood urea estimations of little assistance and frequently found remarkable variations in the results of the urea concentration test. The lack of correlation between the results of these two tests had led him to discontinue blood urea estimations. He relied on the indigo-carmin test, using Thomas's method. A colorimeter was unnecessary, the first and last of three specimens over successive periods of twenty minutes being collected and inspected. Stabilization of renal function was of more importance than isolated estimations. Dr. Burnell always ligated the vas and used a subcutaneous catgut suture. The Harris technique was suitable for every surgeon. During retrigonization he passed the distal end of the stitch through the apex of the trigone, which then went more easily into the prostatic cavity. In the last four years at the Adelaide Hospital 172 prostatectomies had been carried out for adenoma. Of fifty-five patients in whom suturing at the vesical neck was not carried out, ten, or 18.1%, died. Of 94 in whom sutures were used, six, or 5.6%, died. Of 13 in whom primary closure was done, all recovered. Suturing definitely lowered the death rate.

DR. RICHARD HARRIS (Sydney) discussed technique. The first incision in a two-stage operation was always a short transverse one two inches above the symphysis. The bimanual intraurethral method of enucleation was always used by him. Visualization of the prostatic cavity with Harris's retractor was practically perfect. In the process of retrigonization the whole thickness of the trigone was pulled down. He rarely attempted to pick up the urethra. The trigone was sewn down as far as could be conveniently done without tension. Dr. Morson obtained primary healing in 50% of cases. Dr. Harris felt that if Dr. Morson took very wide bites of tissue during the suturing he would get Harris's own figure of at least 90%. Primary closure was not an essential part of the operation, but a nicety of technique. It was neither advisable nor safe with a long vertical incision and a wide dissection of the bladder. Five hundred and forty-seven patients had now been operated upon by S. H. Harris, and the mortality was still 2.7%. Preservation of the verumontanum was essential to the control of sepsis. He always carried out vasoligation as soon as the patient was admitted to hospital. In the estimation of renal function he relied entirely on the indigo-carmin test.

DR. C. ROCHE (Melbourne) had had personal experience of twenty transurethral resections, with one death. The patients suffered from median bar prostatic fibrosis, early middle lobe and early general prostatic enlargement. He had had no hæmorrhage in this series. One patient would require further operation. He felt that the operation would replace open operation in specially selected cases.

DR. J. KENNEDY (Melbourne) said that no operation of convenience should be associated with a mortality of more than 5%. He asked if Dr. Burnell and the rest of the staff on the Adelaide Hospital had used Harris's technique only on selected cases. Freyer's figures (5% mortality in 2,000 cases) were obtained on selected cases. Often in a fat or debilitated patient one could not do Harris's operation. He used on such patients Pilcher's bag, which must be put into the bladder, and not in the prostatic cavity. It was removed next day and did not delay healing.

SIR HENRY NEWLAND (Adelaide) said that the bruising necessarily associated with prostatectomy made it impossible to expect primary healing always to occur. Further advance in technique might be possible with a cutting operation. He would like Harris to examine his patients urethroscopically, as Dr. Morson had done.

Dr. Burnell, in reply to Dr. Kennedy, said that the Adelaide Hospital patients were under the care of eight general surgeons and were not selected in any way for the Harris operation.

Dr. Clifford Morson, replying, said that primary closure had revolutionized prostatectomy, but he selected his cases. He had little confidence in blood urea estimations. The test of greatest help was clinical knowledge. He was glad that only one speaker supported transurethral resection, though it certainly had some uses in fibrosis and carcinoma. He had introduced a radical operation for carcinoma some years ago. He had had some successes, but not enough, and he had now given it up entirely. X rays produced oedema of mucous membrane, which often caused retention of urine, especially with adenoma. Here it was of no use whatever, and he had seen no good results with malignant disease for the same reason. His mortality after operation was 4% or 5%, but the importance of Harris's technique was the comfortable convalescence. Harris had seen the figure-of-eight stitch in use and he thought that he had been agreeably surprised at its value.

Carcinoma of the Colon.

DR. H. B. DEVINE (Melbourne) opened a discussion on carcinoma of the colon. He began by saying that the mortality following operations for removal of carcinoma of the colon was high—much higher than that of other abdominal operations. He quoted statistics from well known clinics to show that the mortality varied from 57% to 15%. Carcinoma of the colon had a low grade of malignancy; it was unusual for it to metastasize early, and it was slow to recur when a faithful attempt had been made to eradicate it. If the operative mortality rate could be lessened, carcinoma of the colon should therefore be the one malignant disease eminently curable by surgery.

Dr. Devine then went on to point out that, from the point of view of surgical operation, its "cesspool-like" function placed the colon in a different category from other parts of the alimentary canal. Moreover, surgery of the distal part of the colon necessarily differed in its basic principles from that of the proximal part. After making passing reference to the enterotome method that he had adopted for carcinoma of the proximal part of the colon, Dr. Devine proceeded to discuss the surgery of carcinoma of the distal part. The patient with carcinoma of the distal part of the colon generally came to the surgeon in the middle stage of his disease: (a) chronically poisoned (metabolically) from the toxic effect of a slowly growing carcinoma, (b) chronically poisoned from the prolonged absorption of the toxic products resulting from chronic intestinal obstruction, (c) with colonic tissue devitalized from the general poisoned condition and also from the local effect of the chronic intestinal obstruction, (d) with

highly pathogenic germ content of the colon. In these circumstances it was obvious why the traditional methods of suture anastomosis were so often followed by death. After drawing attention to the need for earlier diagnosis and for the adoption of a radiological examination of the colon whenever the slightest suspicion was entertained that it might be affected by a cancerous growth, Dr. Devine discussed measures by which the patient's general condition might be improved. These included intravenous nutrition, transfusion of blood, measures to combat anaemia, and pre-operative colonic drainage. Though all the methods of colonic drainage that were adopted were better than no pre-operative drainage, they were all ineffective because they did not completely and permanently disconnect the distal part of the colon from the proximal part.

Dr. Devine's method of operating for carcinoma of the distal part of the colon was based on the principle that if a segment of an animal's bowel was experimentally isolated and thus deprived of its function, its bacterial content would slowly disappear. He therefore first of all disconnected the proximal from the distal part of the colon. This disconnection was made at the transverse colon, if it was mobile enough; otherwise it was made at the hepatic flexure. The cut ends of the bowel were inserted into small separate openings in the abdominal wall. The distal part of the colon was thus completely "defunctioned" and time became a factor in its "debacterIALIZATION". Subsequently the growth was resected. In this way it was possible to carry out an aseptic anastomosis. In dealing with the recto-sigmoid junction a two-stage or a three-stage method might be carried out; these Dr. Devine described. The disconnecting anus was then closed. The series of patients in whom this operation had been performed was too small to allow any generalizations to be made, but Dr. Devine said that the results had been so satisfactory that surgery of the distal part of the colon had not for him the anxiety that it formerly had.

Dr. VICTOR HURLEY (Melbourne) said that the malignancy of carcinoma of the colon was low, but 50% of tumours were inoperable when diagnosed. Sometimes early and widespread dissemination took place. Over 50% of patients were admitted to hospital with intestinal obstruction, and this alone carried a mortality of 50%. Most patients had obstruction in some degree when first seen. There were no characteristic symptoms, and suspicion should be aroused by the association of several features, in themselves trivial, and be followed by complete investigation. Patients were often well nourished and anaemia was not a feature till late. Upper abdominal lesions were often simulated. Examination for occult blood should always be done. Sigmoidoscopy should be done with no anaesthetic and no preparation. The diagnosis should be verified at operation by palpation before any

resection was undertaken. An opaque meal and enema should, if possible, be administered, but an opaque meal might sometimes precipitate complete obstruction. One could usually make or strongly suspect the diagnosis by clinical means. A plain X ray examination might locate the site of obstruction. Bimanual examination was very useful. In the more serious cases the obstruction should be relieved and nothing else done at the first operation. Surgical treatment should be undertaken in stages. The best surgical approach was directly over the growth. Restorative measures, such as blood transfusion, subcutaneous saline injections, and administration of iron were of great use.

Dr. ALAN NEWTON (Melbourne) did not agree with Dr. Devine's technique if the carcinoma was on the right side of the colon. Here he preferred the orthodox method of resection. If obstruction followed this, it was readily and easily dealt with by ileostomy under local anaesthesia. For growths in the left side of the colon, however, Dr. Devine's technique represented a great advance.

Dr. JOHN RAMSAY (Launceston, Tasmania) favoured the Paul-Mikulicz type of operation.

Dr. F. C. PYBUS (Newcastle, England) said that a somewhat wrong impression was given by mortality statistics, as every successful operation meant a life saved. A one-stage operation was ideal, but often not possible. The simulation of dyspepsia by the condition was important. Everything depended on a clean colon. A caecostomy was a mere leak. It was often quite impossible at operation to differentiate between neoplasm and diverticulitis. The time might come when gastro-intestinal surgery would be done in a special department and the results would probably be better. He preferred sutures to clamps.

Dr. H. B. Devine, in reply, stressed the importance of a defunctioned and debacterIALIZED colon. He agreed with Dr. Hurley on the importance of testing for occult blood, which should always be done by the general practitioner. The mucous membrane of the colon should be examined radiographically by relief methods. He had had no good results from caecostomy. When resecting he used no other than a mid-line incision. In the hands of Dr. Newton orthodox resection could be done for right-sided lesions with good results. But for the average surgeon his own technique was better. After an orthodox resection mild degrees of peritonitis might occur around the anastomosis, especially in bad risks. This infection travelled along the suture lines and could be prevented only by not using sutures. Replying to Dr. Ramsay, Dr. Devine said that one could not always apply the Paul type of operation. Replying to Dr. Pybus, he said that with his own technique more could be done for patients in whom the diagnosis was made late. He agreed that caecostomy was unsatisfactory.

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Cæsarean Section.

Dr. J. BRIGHT BANISTER (London) opened a discussion on the present position of Cæsarean section in obstetric practice. He said that in past days Cæsarean section had been performed in order to save the child; nowadays it would almost seem that the operation was regarded as an easy method of delivering a pregnant woman of her child. Whitridge Williams had observed that some misguided

practitioners had viewed labour as a pathological rather than as a physiological process, and so were apt to undertake a serious operation without a due appreciation of its risks. In certain American States the operation was the commonest cause of death after labour; it had been excessively employed in these places, sometimes by surgeons whose ability was not beyond question. Holland had recently drawn attention (in *The Lancet* of April 27, 1935)

to the astounding increase in the number of Cæsarean sections performed, often by operators lacking both judgement and skill. Carefully prepared figures showed that the incidence of the operation was far too high, and the same criticism applied to the maternal mortality which followed it. In 1910, Amand Routh, at St. Petersburg, published 1,282 case reports as the complete experience of more than one hundred British obstetricians then living. As contrasted with these figures, available evidence showed that the operation was performed 1,723 times in one American borough in five years, and 609 times in one English maternity hospital of less than 100 beds during a term of ten years. Routh, too, in 1910 had named twenty-four conditions as being indications for the performance of the operation; these indications had now swollen into a grand total of fifty-five, and included the unwillingness on the part of the patient to submit to the pains of labour. In 2,212 cases of the series (3,486) cited by Dr. Banister, the indication for operation was stated to be contraction of the pelvis—undoubtedly a slur upon the physique of the modern woman.

There were 231 maternal deaths in Dr. Banister's list of 3,486 cases, giving a maternal mortality of 6.6%. The gross maternal mortality of England and Wales was in the region of 0.45%, so that Cæsarean section had a mortality sixteen times as great as that attending all obstetric cases. Admittedly, the operation was sometimes done in grave circumstances and as a last resort, but even so the mortality rate of noted surgeons working in famous maternity hospitals reached the level of 5.8%. Dr. Banister expressed the profound conviction that the operation was performed with undue frequency because of the tendency to regard obstetric problems from a surgical point of view. "Let pus out," said Hilton. "Let the baby out," said the surgically wise but obstetrically foolish. Such counsel implied a contempt for Nature, with her painful but safe technique. In alleged cases of pelvic disproportion section was performed without enlisting the aid of Nature at all, or only after a mock trial of her methods and in apparent ignorance of the fundamental facts of the mechanisms of labour. A second factor making for the undue increase in the number of Cæsarean sections was the inability of some obstetricians, deficient in practical training, to diagnose by examination the cause of delay in labour. Dr. Banister was confident that a tendency existed to overstress the importance of the infant's life as against that of the mother; and he asked all to realize that by subjecting a woman to Cæsarean section the surgeon shouldered the risks of an operation five times greater than that attendant upon childbirth, and conceivably added to the responsibilities of those who might be called upon to manage a future labour in the same patient. Cæsarean section, in certain conditions a beneficent operation, might frequently be considered only as an improper method of quick delivery and a means of avoiding the practice of skilled obstetrics.

PROFESSOR J. B. DAWSON (Dunedin) said that they had been told that day that Cæsarean section carried a mortality of 5% to 6%, and this had been compared with the general maternal mortality of 4.5%. Such a comparison was surely unsound—it compared the evil with the good. A Cæsarean section mortality of 5.8% meant that of 100 women confronted by grave obstetric difficulties or emergencies which were overcome by abdominal delivery about six would die. What they did not know was what would have happened to these 100 women if their obstetric dilemmas had been circumvented by other means. He ventured to suggest that the mortality would have been similar or worse. Such figures were difficult to obtain, but minor disproportion overcome by high forceps delivery or craniotomy would give a maternal mortality of at least 6%, whereas for central *placenta prævia* Cæsarean section gave better results than version. Beckwith Whitehouse had pointed out that central *placenta prævia* treated by version had a mortality of 8.5%, and by section of 6.6%. Nevertheless the death rate following the operation was too high. It would not be difficult to collect a series of cases from the work of one man or one clinic that would show a negligible mortality. In British countries today

it was not that too many sections were being done, but that too many were being done too late. The disasters did not follow prompt decisive action, but operations performed after long delay, begotten by hesitation out of hope, a delay which added a terrific risk to subsequent operations. It was, however, obvious that provision must exist or be made for the prompt diagnosis of obstetric difficulty and that the delayed operation should be eliminated.

DR. W. IVON HAYES (Melbourne) said that in fifteen years the Women's Hospital, Melbourne, obstetrical staff had performed 545 sections in a total of 43,727 deliveries, with a mortality of 6%. Indications were: contracted pelvis and disproportion (345 cases, 10 deaths, or 2.9%); eclampsia (38 cases, 8 deaths, or 21%); renal toxæmia (23 cases, 3 deaths, or 13%); contracted pelvis with eclampsia or renal toxæmia (11 cases, 2 deaths, or 18%); accidental hæmorrhage (14 cases, 3 deaths, or 21%); *placenta prævia* (47 cases, 1 death, or 2.1%). In severe concealed accidental hæmorrhage section had been abandoned and replaced by blood transfusions *et cetera*. There was a definite place for section in the treatment of *placenta prævia*, but only in selected cases, as follows: (i) any degree of *placenta prævia* in a *primipara* not in labour, (ii) any central *placenta prævia*, and (iii) any degree of *placenta prævia* when the child was a "good risk" and specially desired. In gross disproportion the routine treatment had been elective section. Fatalities tended to occur in the cases operated on late in labour; thus long trials of labour prior to section were to be condemned. Of the 345 sections in the disproportion group, 297 were performed while the membranes were intact or within twelve hours of their rupture with a mortality of 1.3%; 48 patients were operated on later than twelve hours after rupture of the membranes with a mortality of 12.5%, sepsis being the cause of death in each case. Thus a classical Cæsarean section might be done in those cases in which the membranes had not been ruptured for more than twelve hours, and in all others the lower uterine technique and drainage or hysterectomy should be performed. In Dr. Hayes's opinion lower segment Cæsarean section had so many advantages that it should become the regular method of abdominal delivery among obstetric surgeons. Hysterectomy was indicated when the patient showed signs of definite infection and when the membranes had been ruptured a considerable time, or when there had been a history of repeated examinations or repeated attempts at delivery.

DR. H. A. RIDLER (Sydney) said that it might be stated generally that the greater the number of Cæsarean sections performed by an obstetrician, the less was he competent to arrive at a sound obstetric judgement. They all agreed with Dr. Banister's statement regarding the great widening of the indication during the last twenty years. This was the result of modern times of love of the dramatic, of the desire to earn a big fee easily, and of the love of speed. Cæsarean section was so quick, the art of obstetrics took too long and was wearisome to learn. Some patients even liked Cæsarean section with the prospect of sterilization. Many *primiparae* with slight diminution of pelvic measurement had been subjected to Cæsarean section without being allowed to come into labour. No one could tell for certain before labour commenced whether a fœtus would pass through the pelvis or not. Some recent indications for Cæsarean section were real and absolute, for example, congenital absence of vagina, rigid cervix following radium therapy, and previous rupture of the uterus. His experience had been that the lower segment operation gave a lower death rate.

DR. F. BROWN CRAIG (Sydney) said that mature obstetrical opinion should be obtained before Cæsarean section was performed, and that it should be performed by an experienced obstetrician and not by a surgeon.

DR. E. R. WHITE (Melbourne) referred to the *primipara* in the early forties and quoted the case of one who delivered herself with ease at the age of forty-four. He also raised the question of the common complication of

post-operative distension, advocating its prophylaxis by pre-operative treatment and by careful sewing up of abdominal walls.

DR. JOHN GREEN (Melbourne) stated that the "blurring" of diagnosis was possibly responsible for the divergent views on the operation. He wanted to know why the incidence of operation was twice as great at the Queen Charlotte as at Melbourne Women's Hospital, and why it was so seldom used at the East End Maternity Hospital. He also wanted to know what Dr. Banister would say to the patient's relatives in the case of a difficult forceps delivery in which there was no real danger to the mother, but real danger to the child.

The President said that the medical man who performed the so-called "request" operations had a low ethical code.

Dr. Banister, in reply, stated that Nature was not quick; therefore, as observers of her art, obstetricians should not be quick. They often noticed cases in which the first stages of labour were prolonged and the second stage terminated the case comparatively quickly. If the elderly *primipara* showed indication of Cæsarean section, then the case became an obstetrical problem and not one of "how to deliver a woman of over forty-two". In answer to Dr. Green, he stated that at the East End Maternity Hospital the cases were mainly delivered by the matron, who was one of the outstanding obstetrical women of the world; that this hospital served the same district as the London Hospital, but that practitioners sent apparently normal cases to it and cases that might be difficult to the London Hospital. His advice was to say nothing to the relatives until the practitioner had made up his mind, and for this a full examination under a general anæsthetic was necessary.

Placenta Prævia.

SIR COMYNS BERKELEY (London) opened a discussion on the subject of *placenta prævia*. He said that the material on which his paper was based consisted of 4,374 cases abstracted from 130 hospital reports. Amongst some 382,000 women admitted into or treated at nineteen hospitals the complication of unavoidable hæmorrhage occurred once in 87.3 cases (1.13%). Among these patients there were 4,267 cases of accidental hæmorrhage, or 1 in 89.6. Amongst 3,627 cases which were subjected to special study there were 218 deaths (6%). The details as to age were elicited from 3,161 patients. The youngest patient was sixteen years of age, and six patients were recorded as being over forty-nine years old. In patients over thirty-six years of age the death rate was 6.1; under that age the rate was 5.7. As to the parity of the patients, in a total of 3,639, 756 women were *primigravida* and 2,893 *multipara*.

The complication was first diagnosed between the thirty-sixth and fortieth weeks of pregnancy in 57.3% (3,452 cases), the greatest incidence being at the fortieth week. Amongst 3,686 children born, 1,576 (47%) survived, while 2,110 were stillborn, macerated, or died soon after delivery.

Sir Comyns Berkeley said there yet existed no precise and fixed official definition of the three forms of *placenta prævia*. He himself divided the several varieties into complete (os entirely covered), incomplete (os partly covered), and lateral (no part of the os covered). The complete and lateral forms might in truth become incomplete in due course. The obstetrician should decide at the first examination with which variety he had to deal. In the cases studied Sir Comyns Berkeley determined that complete *placenta prævia* occurred in 24.7% and the incomplete and lateral types in 42.9% and 32.4% respectively.

Sir Comyns Berkeley then enunciated the chief rules to be observed in the treatment of *placenta prævia*. First, bleeding must be controlled at the earliest possible moment. Shock must be treated and every effort made to prevent sepsis. Delivery must be unhastened, except in cases requiring Cæsarean section. Pelvic examinations should never be made unless the obstetrician was prepared to

commence treatment at once. Except in the event of perilous bleeding, the placenta should not be expelled until it was completely separated. If perforation of the placenta were required, the operation should be performed with a sharp-pointed instrument. Vaginal packing should consist of material soaked in reliable antiseptics. Lastly, Cæsarean hysterectomy should, if possible, be avoided.

As regards the question of bleeding, Sir Comyns Berkeley stated that the method of control hinged upon the variety of *placenta prævia* present. Packing of the vagina was a dangerous procedure; it resulted in an increase in the death rate, and should seldom be employed. The treatment of shock included blood transfusion and intravenous injection of gum acacia and glucose. Sepsis was best avoided by treating patients in the best possible surroundings and by reducing pelvic examinations and vaginal manipulations. If such manipulations were unavoidable or vaginal packing called for, antiseptics such as 1 in 1,000 flavine solution should be used.

The slow progress of labour favoured the occurrence of thrombosis in the uterine blood vessels and reduced the chances of tearing of the friable cervix or lower uterine segment. Shock and bleeding once controlled, the brighter were the chances for both mother and child. It appeared that the performance of internal version, as well as the practice of bringing down and pulling upon a fetal leg caused a sharp increase in maternal and fetal mortality. Pituitrin was a dangerous drug in the treatment of *placenta prævia*, and its use should be condemned. Quoting a paper by Eardley Holland, Sir Comyns Berkeley reminded his hearers that 50% of infantile deaths were due to tentorial tears following rapid delivery. Rapid delivery, however, might be indicated in cases in which a de Ribes bag had been employed. The bag once expelled, bleeding might recommence owing to lack of pressure on the placental site, and the situation then demanded the quick delivery of the child. The danger inherent in making pelvic examinations without making provision for immediate treatment arose from the fact that such examinations might separate additional areas of the placenta and so increase bleeding to a serious extent.

Attempts at separation or expression of the placenta, when the loss of even a few ounces of blood might turn the scale against the patient, were to be strongly reprehended. There was, however, one exception to this general rule: the uterus must be quickly emptied when, after the birth of the child, a *post partum* hæmorrhage occurred. In cases requiring perforation of the placenta the use of blunt instruments rendered the operation difficult and was likely to result in additional separation of the placenta from the uterine wall. For these reasons, therefore, a sharp pointed instrument should be employed.

The maternal mortality rate following Cæsarean hysterectomy was extremely high, and the operation should, if possible, be avoided. Possible exceptions to this general rule existed; the operation of hysterectomy might be indicated in cases of uncontrollable bleeding after the child's birth, and also when a patient was obviously infected, although in this latter condition Bright Banister had reported cases of Cæsarean section in which the treatment of the interior of the uterus with violet green had been highly successful.

In Sir Comyns Berkeley's view, the best results in treatment followed the adoption of one specific method to the exclusion of all others. The chosen method would depend on the environment and condition of the patient. It seemed true that patients under the care of expert obstetricians progressed more favourably than those left to the care of resident medical officers. Further, the death rate amongst patients given preliminary treatment before admission to hospital was higher than amongst those women who were treated from the outset in a suitable institution.

For the treatment of complete *placenta prævia*, and when the patient was thirty-six weeks pregnant, the best method was Cæsarean section. The death rate was 4.9% and the percentage of surviving children 86.4%. When the method of bringing down a leg was used, only 23.5% of the children survived. In patients whose pregnancy was of

shorter duration than thirty-six weeks, the advantages of Cæsarean section were not so great, and the death rate (4.2%) compared unfavourably with that following the bringing down of a foetal leg (2.9%). This proceeding, however, was accompanied by a high foetal death rate (only 3.8% of the children survived, as against 45.2% when Cæsarean section was used). Cæsarean section was therefore to be recommended when to have a live child was of great importance. Of all obstetric operations, except that of bringing down a leg in breech presentation, that of Cæsarean section had the lowest maternal and foetal mortality rate. Further, there was ample justification for its performance upon *multipara* pregnant for more than thirty-six weeks. When the term of pregnancy was less than thirty-six weeks, the operation was not justified; the patient already had children, and the method of bringing down a leg, accompanied as it was by a lower maternal mortality, should be adopted. Considering the treatment of incomplete *placenta prævia*, Sir Comyns Berkeley emphasized the high percentage of living children (68% and 77.8% respectively) which was associated with spontaneous labour and Cæsarean section. The latter operation, however, was attended with a maternal mortality rate of 4.5%. For that reason he advocated the use of the de Ribes bag. When this was used the maternal death rate was no more than 2.7% and the percentage of living children 32.4.

The condition of lateral *placenta prævia* was undoubtedly over-treated, since statistics revealed a list of no less than thirty-five methods. The safest plan was to allow labour to progress and not to interfere. Such a plan resulted in a maternal mortality of less than 1%, with 71.7% of living children. Next in order of safety was the process of rupturing the membranes and the bringing down of a leg in breech presentations. To pack the vagina was dangerous; not only was it done inefficiently by many outside practitioners, with the result that it served no useful purpose, but it increased the risks of sepsis. But dangerous bleeding while the patient was still outside a hospital or while the patient was prevented by various causes from deriving benefit from Cæsarean section, blood transfusion or gum and glucose injection might make the necessity for vaginal packing of supreme importance as an emergency measure. To conclude, Sir Comyns Berkeley appended a statistical table in which the dangers of vaginal packing were clearly apparent as compared with those attendant upon other methods of treatment.

PROFESSOR J. C. WINDEYER (Sydney) said that he had no doubt that this stupendous compilation of statistics and the deductions therefrom by Sir Comyns Berkeley would prove to be of world-wide importance. The opener had mentioned that treatment of *placenta prævia* by a single rather than by composite methods gave more favourable results. Professor Windeyer suggested as an explanation of this that: (i) the cases treated by composite methods were the more severe cases, (ii) the operators had less skill and experience. There was no doubt that the best results were obtained when the patients treated had been under the direct control of one capable man in the hospital. In obstetrical teaching hospitals it was a necessity for students and resident medical officers to learn how to perform obstetrical operations, and thereby the results obtained might not reach the ideal. He advocated "scalp" traction for the following reasons: (i) it could be used through a small os, (ii) a minimum of vaginal and intrauterine manipulation was required, (iii) forceps could be applied in a short space of time, (iv) traction could be applied to the handles by means of a light weight over a pulley at the end of the bed. In 100 cases in the Royal Hospital for Women, Sydney, 79 were vertex presentations, 11 breech, 10 transverse or oblique lie, 1 an anencephalic monster. Thus scalp traction could be used in these 79 cases, and Professor Windeyer was of the opinion that it should take the place of vaginal plugging and bipolar version. Control of hæmorrhage during and after the third stage was of the greatest importance. If there was any blood loss, an attempt should be made to express the placenta; if this failed, it should be removed manually, and this should be followed by bimanual com-

pression of the uterus and injection of pituitrin and ernutin. In 100 cases treated at the Royal Hospital for Women, Sydney, 27 required no treatment beyond expression of the placenta; in 58 the placenta was manually removed; in 30 bimanual compression of the uterus was performed; in two the uterus was packed with gauze. In vaginal plugging he used pledgets of cotton wool which had been soaked in lysol solution and squeezed dry. He never used gauze packing of the vagina.

DR. A. M. WILSON (Melbourne) stated that at the Queen Victoria Hospital, Melbourne, in ten years there were 42 cases of *placenta prævia* in 13,627 deliveries, almost all being drawn from the ante-natal department. At the Women's Hospital, Melbourne, in three years prior to 1934 there were 62 cases of *placenta prævia* in 10,124 deliveries, this higher incidence being due to the greater proportion of emergency cases. Thus *placenta prævia* was a comparatively rare complication of pregnancy. Owing to the greater appreciation of the surgical possibilities of these cases *placenta prævia* had lost many of its terrors for the obstetrician. The maternal mortality quoted in older text books varied from 5% to 15%. Among the 103 cases quoted (one being excluded, as the mother died just as she was being carried into the hospital) there were four deaths, a maternal mortality of 2.5%. These excellent figures were due to the fact that the cases were treated by efficient obstetricians in specialized hospitals. The sudden appearance of a painless, causeless hæmorrhage was almost pathognomonic of *placenta prævia*. Once the condition was diagnosed, the advisability of terminating the pregnancy should be considered. It was very rare for a patient with a *placenta prævia* to die with a first hæmorrhage, but it was quite certain that if she had had one hæmorrhage before labour started she would have another. The most dangerous cases were those in which there had been repeated hæmorrhages. In practice, if the internal os was slightly open, the case responded fairly readily to medicinal stimulation and rupture of the membranes. If *placenta prævia* was central or if the internal os was tightly closed or very rigid or hypertrophied, Cæsarean section might be the method of choice. In treatment at the Women's Hospital, Melbourne, the blood of each of these patients was typed on admission against available relatives. Among the last 62 patients treated 11% required blood transfusion. Packing the vagina in these cases raised the morbidity from 20% to 50%, and therefore should be used only as a temporary measure. In lateral or marginal *placenta prævia* and in a vertex presentation rupture of the membranes with or without the use of Willett's clamp if the patient was in labour was most satisfactory. In breech presentations rupture of the membranes, pulling down a leg and leaving delivery to Nature was the method of choice, but was accompanied by 80% foetal mortality. Braxton Hicks's bipolar version without extraction of the fetus was still the method of choice for the serious emergency, the delivery of the child being left to Nature if efficient surgical facilities were not available. In central *placenta prævia*, especially if associated with primiparity, stenosis, rigidity or hypertrophy of the cervix, Cæsarean section was undoubtedly a life-saving operation for the mother; but the mother should be a good surgical risk and the hospital obstetrician and assistants should be efficient. This method of treatment was becoming more popular at the Melbourne Women's Hospital, but still the cases suitable for section were relatively small—40 cases out of 45,000 deliveries in the last thirteen years. In these cases there was one maternal death from pulmonary embolism, as the patient was about to be discharged from hospital; the foetal mortality, including neonatal death, being 12.5%. In conclusion, Dr. Wilson expressed strong approval of the Cæsarean operation in picked cases and under picked conditions, but not to the exclusion of other methods of treatment, which in serious emergency, under inefficient conditions, and in the minor degrees of *placenta prævia* would undoubtedly prove more satisfactory.

DR. LANDER (Plymouth, England), speaking as a general practitioner, asked Sir Comyns Berkeley what caused *placenta prævia*. He condemned vaginal packing

and thought that bipolar version was very difficult in the surroundings in which a general practitioner was usually called upon to work. He preferred rupture of the membranes and evacuation of a large amount of *liquor amnii*. He advocated perforating the placenta with the forefinger, and thought that the patient should be kept on her back, with the obstetrician's hand on the fundus and waiting for delivery.

DR. H. M. ELLIOT SMITH (Brisbane) advocated vaginal packing and said that the dangers associated with packing lay only in "hurry" and the surroundings under which it was done. He used intrauterine packing forceps for perforating the placenta.

DAME CONSTANCE D'ARCY (Sydney) advocated Cæsarean section in central *placenta prævia*, but was not in favour of the lower segment operation. She liked "Percaïne" given as a spinal anæsthetic for these cases.

The President stated that as a rule the minor degrees of *placenta prævia* were over-treated. He advocated in these cases rupture of the membranes and application of an abdominal binder, and in central *placenta prævia* of over thirty-six weeks' gestation, Cæsarean section.

Sir Comyns Berkeley, in reply, said that Cæsarean section was ideal for complete *placenta prævia*, rupture of the membranes for incomplete, and for lateral *placenta prævia* the patient should be left alone. He agreed with Dr. Wilson in terminating the pregnancy when once the patient had had much bleeding, and said that when *placenta prævia* was diagnosed the line of treatment should be determined and then carried out. He did not know the ætiology of *placenta prævia*.

The Late Toxæmias of Pregnancy.

DR. JOHN S. FAIRBAIRN (London) opened a discussion on the prevention and prognosis of the late toxæmias of pregnancy. Dr. Fairbairn said that "late" toxæmic manifestations comprised those arising after the twenty-eighth week, so establishing a definition that excluded those cases of chronic nephritis, the symptoms of which were of earlier origin. But the disorders labelled "toxæmias of pregnancy", however much their group title might be justified on pathological grounds, could not be segregated as clinical entities as the result of the discovery of well defined toxins. Reliance had therefore to be placed upon the recognized clinical features of the group, such as a true albuminuria or a raised blood pressure, associated with œdema, headache, vomiting, insomnia, cramps, polyneuritis and *ante partum hæmorrhages*. In effect there was a certain descriptive vagueness surrounding the syndrome characteristic of this well defined batch of disorders, but F. J. Browne's dictum, founded upon an analysis of 320 cases of the condition, named "preeclampsia", that the cause, whatever it might be, could produce any one of the above signs or symptoms, was acceptable to Dr. Fairbairn.

As to prevention, Dr. Fairbairn considered that any constructive policy would involve the formulation of some special plan of hygiene for expectant mothers. In 1922, he said, Marshall had laid down the requisite dietary conditions—the provision of carbohydrates, calcium and vitamins in abundance. Since that day dietetic prophylaxis was the central point about which discussion still revolved. A fruit diet, a flesh-free diet, a salt-free diet, a diet well stocked with calcium, phosphorus, iodine and iron were based upon theoretical considerations. They were designed to enable the individual to avoid certain diseases; they had not proved their efficacy by clinical demonstration. During the Great War, said Dr. Fairbairn, while the population of Central Europe was half starved, the eclampsia rate unaccountably dropped. Some said a low protein diet was the direct cause of the phenomenon, with resultant effects upon the dietetics of eclampsia; but Theobald regarded the toxæmias of pregnancy as true deficiency diseases requiring a complete diet, containing vitamins, calcium, iron and iodides. The dietary of Theobald included milk in abundance, cod liver oil, fruit, butter and green vegetables.

Calcium during pregnancy was a special need, particularly during the last two months. The calcium of milk, butter and cheese was absorbable and might be supplemented by intramuscular injections of calcium gluconate, while extra carbohydrate in the diet would combat the risks of acidosis during the later days of pregnancy, especially if a prolonged labour were to be feared. Marshall's dietetic régime, said Dr. Fairbairn, needed few addenda, except that the need for fresh food should be emphasized and the proteins of fish, eggs and milk provided rather than those of meat. Dr. Fairbairn also stressed the importance of personal hygiene and the avoidance of all chances of contracting casual infections, particularly in the case of patients with chronic nephritis.

Discussing the prevention of complications, Dr. Fairbairn advocated the frequent examination of expectant mothers and the prompt treatment of all such as manifested toxæmic symptoms by dietetic means, and by the administration of magnesium sulphate and alkalis. Rest in bed would now permit of close observation and treatment, while termination of pregnancy might be brought about if the signs and symptoms were of grave import.

Until fifteen years ago the prognosis in cases involving toxæmic pregnant women was a matter of predicting the risks of eclampsia; since then, with increased care for prospective mothers, the risks of persistent or recurrent albuminuria had attracted attention. Yet in the ten years 1921 to 1931, in spite of the treatment of women in so-called preeclamptic states, and in spite of the continuance of such treatment since, the mortality from renal disease in married women, as compared with that in single women, showed that the forebodings of obstetricians were unwarranted. But, said Dr. Fairbairn, the contention that eclampsia might be prevented was but an intelligent anticipation. There existed no method of preventing the onset of toxæmic states, and the onset of convulsions might be unheralded and so rapid as to prohibit treatment. The cardinal signs—raised blood pressure, headache, visual disorder, diminution in urinary output, might easily escape notice during labour and after it; but it might be said that the prognosis in eclampsia depended upon the number of the fits and their sequelæ. Jaundice, coma, fever, and a rapid pulse were of grave import. A fall in pulse rate and a rise in urinary output, even up to 200 ounces in amount, with diminishing traces of albumin, should be sources of comfort. In conditions of toxæmic albuminuria the daily urinary excretion, and not the amount of urinary proteins, was the valuable prognostic index. Lessening œdema and a falling blood pressure were hopeful indications, and a residual albuminuria was not a matter for concern in the presence of satisfactory results to blood urea and urea concentration tests.

Dr. Fairbairn advanced the view that the severity of toxæmia in pregnancy was of small importance as compared with its duration; chronic illness favoured recurrent attacks and the onset of chronic nephritis much more than did the short, sharp toxæmia of non-convulsive type. It was therefore a matter of importance to terminate pregnancy before permanent damage was done. It was usual to recommend an interval of two years before the adventure of another pregnancy was made, but that arbitrary period might be cut down for women of fast-diminishing fertility. Conjugal partners should be well aware that a close watch must be kept on such pregnancies and that a second failure, through toxæmia, was a bar to all future attempts at successful pregnancy. Regarding the prognostic significance of blood pressure readings, Banister had regarded a systolic pressure below 150 millimetres of mercury as a sign that recurring albuminuria was unlikely. Ocular changes, of serious moment to the mother's eyesight, should be a sufficient cause for the immediate termination of pregnancy. The fetus faced a risk of intrauterine death in non-convulsive toxæmias, a peril which increased when convulsions occurred. Danger to the fetus was greater in chronic nephritis than in toxæmic states.

DR. J. S. GREEN (Melbourne) said that in less acute toxæmias there was a strong tendency to complete recovery, but there was a sinister influence which caused trouble

in the immediate pregnancy and which caused a varying degree of medical disability. Specific prognosis in the individual case was very difficult, as there was a marked variation in the end result in apparently similar cases, and the sequences were often very confusing. The following five factors were a guide in prognosis: early onset of symptoms (under thirty-five weeks), significant past history, age and parity, bad renal function, persistence of albuminuria and high blood pressure. In prevention, rest, elimination, dental attention, well balanced diet were of assistance, but serious complications could not be prevented in the present state of knowledge. Recurrences occurred in at least one-third of the cases. Medical disability undoubtedly caused some of the remote tragedy of child-bearing, but there was a very strong tendency to improvement with time, as albuminuria tended to improve. Nevertheless the persistence in many cases of a raised blood pressure and low response to the urea concentration test suggested a latent phase with possibilities of relapse under the stress of further pregnancy.

DR. F. BROWN CRAIG (Sydney) thought that intestinal toxæmia had something to do with the aetiology. In a series of 5,000 cases he had found that constipation was a general rule in early pregnancy. With treatment of the constipation albuminuria became less. Dr. Craig said that he induced labour if the patients did not respond to eliminative and dietetic treatment. Danger lay in over-feeding rather than in under-feeding, and diet was more important in the first than in later pregnancies. He noticed a seasonal increase in the toxæmias of pregnancy, the admissions to hospital being 15-5% greater in the cold than in the warm months.

DR. KENNETH WILSON (Brisbane) said that he could always prevent a patient from developing these conditions, and he thought that there would be no further advance until the aetiology of the toxæmias was known. He advocated careful antenatal care, administration of calcium and alkalis, but did not think there was any specific diet of value. He thought that permanent renal damage was influenced more by the length of the attack than by the severity of the symptoms.

DR. MARY DE GARIS (Geelong, Victoria) stated that the effect of long labour on the urine was to produce pus cells, hyaline casts, acidosis and a change in urinary colour. She was very much against "starving" her patients. She prohibited condiments and salted meats only, and stressed the danger of a low protein diet and the importance of dental hygiene.

PROFESSOR J. B. DAWSON (Dunedin) stated that one toxin, when circulating in the body, by its action on the organs of the body produced further toxins, which tended to complicate the picture. He thought that the ductless glands played a definite part in the aetiology of this complaint.

DR. H. S. JACOBS (Melbourne) said that toxæmia was physiological and that in his practice he insisted upon his patient producing weight cards every month, and, as the average increase in weight in pregnancy, was about five pounds a month, anything over this warned him of the approach of a toxæmia.

DR. R. F. MATTERS (Adelaide) pointed out that recent work by Hoffman and others on the posterior pituitary showed that one of its actions was water retention in the tissues of the body, and he thought that this had a bearing on the aetiology of toxæmia of pregnancy.

PROFESSOR J. C. WINDEYER (the Chairman) stressed the importance of blood pressure estimation, quantity of urine passed, and diet as being of great importance, but stated that Australian butter, owing to bountiful sunlight, was fully charged with vitamins, and that biochemists analysing Australian vegetables, said that they contained a sufficiency of calcium.

Dr. Fairbairn, in reply, said that the toxæmia of pregnancy was a disease of theories, and he thought that the careful observation of methods of treatment would help to reveal the cause of the condition. He looked on albumin-

uria as a warning symptom of great importance in pointing to the possible onset of a toxæmia, but held that raised blood pressure was of far greater prognostic value. The presence of albumin in the urine during labour, in his opinion, was caused in a similar way to the albuminuria associated with exercise in the young athlete. The amount of urine excreted was most important in prognosis, and efficient nursing and administration of morphine were of great value in treatment.

Remote Results of Puerperal Sepsis.

SIR EWEN MACLEAN (Cardiff) opened a discussion on the remote results of puerperal sepsis. The whole world, he said, had concerned itself with the tragic results of maternal mortality, but little was known about the immense question of maternal morbidity. Happily, the Health Organization of the League of Nations was busy in formulating some common form of inquiry into the matter, a process which involved some common standard of computing morbidity rates. The problem, however, might prove easier of solution, since the system of keeping of the mortality rates had been widely acclaimed and had been productive of good results. Some similar international scheme of research into morbidity rates might prove of equal value.

Sir Ewen Maclean stated that Munro Kerr had pointed out the inadequacy of pyrexial records covering only short periods of time during the puerperium; extensive investigation was necessary into the histories of child-bearing mothers who died after childbirth, no matter at how long an interval. Infection rendered many women sterile long before their climacteric, and the familial and communal results were beyond computation. This statement was borne out by statistics published by McIntyre, of the Royal Samaritan Hospital, Glasgow. Analysis of 2,700 cases of infective lesions in the reproductive tract as the direct results of childbirth led McIntyre to comment upon the difficulty of naming the infecting organism of the lower genital tract. In the upper levels the problem was magnified; there pus or inflammatory exudate was for the most part sterile.

McIntyre, proceeded Sir Ewen Maclean, had stated that not a few cases of chronic endocervicitis were instances of puerperal infective lesions within the pelvis, ending in chronic infective lesions of a disabling kind; and, further, that sequelæ of this variety following puerperal sepsis with or without trauma were of great importance as predisposing to carcinoma. Professor Strachan had expressed the opinion that trauma of some sort was inevitable in labour and that the after-effects might be as serious after slight as after gross cervical laceration. It appeared that these after-effects and their symptoms were not dependent upon the mere physical extent of the sustained injury, but upon the degree of infection. Many cervical tears were so small as to pass unnoticed and could not be repaired by immediate suture. None the less, the appearance at a long distant interval of chronic irritative lesions of the cervical tissues was to be apprehended from these causes and was of great import.

Perhaps in no other bodily organ were infective processes more persistent, more eager to abet all influences which favoured unruly and degenerative processes, than in the case of those which attacked the *cervix uteri*. Strachan had stated, however, in rebutting the views of those who considered that so-called "erosions" were not in reality chronic ulcers, but were due to extrusions of columnar epithelium on the vaginal cervix, that there was no junction between columnar and squamous epithelium in these conditions. Raw granulating areas were demonstrable microscopically between the columnar and squamous epithelium, and in such areas chronic infective processes continued, sometimes for years.

Cervical infections were favourably influenced by the menopause. Its onset might reduce an enlarged, chronically infected cervix to the proportions of a tiny nodule in the vault of the vagina. Yet, on occasion, epithelial cells might continue to flourish after the menopause without any evidences of the atrophy which normally occurred in the *corpus uteri* at the climacteric. Regarding the

incidence of cervical carcinoma, Strachan had found in a review of 300 cases that 54% arose after the menopause, a finding corroborated by Wilson, Williams and Weibel. It seemed that the growth-inhibiting powers of the fibromuscular tissues were lessened during the post-menopausal years and that the epithelial elements were then liable to grow unrestrictedly in the squamous and columnar layers.

Turning to the problem of chronic corporeal endometritis, Sir Ewen Maclean cited McIntyre as stating that the condition was proven to have originated from puerperal infection in 11.6% in 103 cases. Chronic subinvolution and chronic metritis had their origins in puerperal infection in 10% of cases, and in half of these there was a history of instrumental delivery. Fifty-nine cases of inflammatory lesions of the tubes and ovaries had been reviewed. Among these, twenty-one patients gave a clear or presumptive history of puerperal infection. At operation it was comparatively a rare event to discover pus in such cases, and a rarer event still to identify a causal organism. The local signs and symptoms of illness were few, though evidences of poor general health were manifest. The "ambulatory treatment", sponsored by Curtis, had appeared to be of value, and the tendency to perform exploratory laparotomy was less popular. McIntyre and his colleagues had formed the opinion that gonococcal infections were rare in the higher portions of the genital tract, and the gonococcus had not been isolated from pus found in these situations. Of bladder infections occurring during the puerperium it might be said that they were productive of mild invalidism, discomfort, vaginal discharge, and even of sterility if restricted to the lower portion of the genital tract, but admitted of treatment without serious loss of tissue; advancing to the upper levels, they might be the cause of grave tissue destruction, loss of reproductive organs, and of permanent and crippling ill-health. Fortunately, the operative mortality was extremely small. Sir Ewen Maclean said, in conclusion, that the risks attending puerperal thrombosis tended in some quarters to be over-estimated and that patients suffering from the affection were often kept in bed for unnecessarily lengthy periods. Phlegmasia of one or both limbs was usually the cause of prolonged disablement and required continued treatment in the physiotherapeutic department of a hospital.

DR. RUPERT FURBER (Sydney) referred to the relationship between puerperal sepsis and *fibrosis uteri* and metritis, so-called. In 94 cases that he had investigated, only three patients gave a history of severe, and two of mild, puerperal sepsis, so that, although the average age of the 94 patients was forty-one at the time of treatment, he was unable to find any real proof that *fibrosis uteri* was commonly caused by puerperal sepsis. Wilfred Shaw's conception of the state of every parous uterus was that it was one of "halted involution" and that the amount of elastic tissue was proportional to the parity of the woman. It was accepted that the proportion of fibrous tissue to muscle before puberty was as three to two. These figures were reversed during the child-bearing period.

DR. ARTHUR SHERWIN (Melbourne) dealt with the results of puerperal sepsis affecting the Fallopian tubes, ovaries, pelvic peritoneum and cellular tissue. In his opinion puerperal sepsis was too frequently blamed for tubal inflammation, and while there was fairly unanimous agreement regarding the exciting bacterial causes, there was no such unanimity regarding the pathway of the spreading infections from the uterine cavity or the resultant pathological changes caused thereby. Martland stated that in acute puerperal peritonitis, which was found in approximately 50% of the fatal cases, the usual mode of spread from the uterine cavity was by way of the Fallopian tube. Donald McIntyre and Munro Kerr seemed to hold these views. On the contrary, Williams and McCallum held that puerperal infection did not occur by this route, but that it occurred as a direct spread by way of lymphatics to the peritoneum or as a thrombo-phlebitis through the placental site into the blood stream. In the report of *post mortem* findings at the Queen Charlotte Hospital it was stated that in a third of the autopsies in such cases the tubes contained pus, probably owing to a "tracking back" from

the peritoneal cavity. In 82 autopsies carried out at the Women's Hospital, Melbourne, only five cases of adnexal infection, all of which were unilateral, were found. Three of these cases were post-abortion, and the abscess was in the ovary only. Two of them were in the tube. One of these was post-abortion, and in this instance there was an abscess at the uterine cornu of the same side. One puerperal and a tubal abscess were present. There were 35 cases of cellulitis and thrombo-phlebitis, accompanied in 16 instances by general peritonitis; but in no instance was there any evidence of pathological change in the tube. Blair Bell stated that streptococcal and staphylococcal infections did not destroy the mucous membrane of the tube in the way that gonococcal infection did; and complete functional recovery might occur after puerperal infection. In records of the last 3,000 maternity cases attended by the Victorian District Nursing Society it was seen that 18 patients developed puerperal fever; three of these died, and of those remaining, nine subsequently became pregnant; the remaining six were those most recently septic, and it was reasonable to expect that some, if not all, would become pregnant later. Donald McIntyre showed in his table 59 women suffering from adnexal inflammation, with an average interval of five and a half years since their last confinement, only twelve of whom gave a definite history of puerperal fever. It seemed to Dr. Sherwin that McIntyre was setting a high premium on the virtue of these women, because the records of the venereal disease clinic at the Women's Hospital showed that the proportion of nulliparous to multiparous women was in the ratio of three to four. Curtis stressed that in his series of 192 cases of adnexal inflammation 70% were gonococcal in origin. Besides the possibility of gonococcal infection, the long interval made it possible that infection had occurred from contraceptive pessaries, instrumental trauma, and so forth. In Dr. Sherwin's opinion, therefore, puerperal infection did not usually spread by way of the lumen of the tubes, and if infected patients were treated expectantly, the great majority who recovered would have complete adnexal function.

DR. EDWARD WHITE (Melbourne) said that at the Women's Hospital, Melbourne, 100 patients with post-*puerperal* and 300 with post-abortion sepsis were admitted annually, and it was his experience that if they were treated expectantly Nature would bring about healing, and many of these patients had returned later pregnant.

DR. B. M. SUTHERLAND (Melbourne) stated that puerperal sepsis was responsible for chronic invalidism, but only rarely for sterility. In some cases mild and chronic cystitis followed cervicitis. Pelvic cellulitis occasionally led to constriction of the ureter and subsequent pyelitis, and patients suffering from *phlegmasia alba dolens* often became subject to menorrhagia and metrorrhagia, necessitating hysterectomy.

DR. J. S. FAIRBAIRN, the President, congratulated Dr. Sutherland as being the only one taking part in the discussion to stress the main points of the late results of puerperal sepsis.

PROFESSOR J. C. WINDEYER, the Chairman, thought that the obstetrician was blamed far too frequently for delayed results of puerperal sepsis.

Sir Ewen Maclean, in reply, said he was glad to observe that the operation rate in cases of tubal sepsis was gradually decreasing. He thought that the mode of infection was as Dr. Sherwin suggested, and entirely agreed with the views Dr. Sherwin advocated regarding the advisability of conservative treatment in early puerperal sepsis.

The Ovarian Cycle and its Relationship to Endocrinology.

DR. NINIAN McI. FALKNER (Dublin) opened a discussion on the ovarian cycle and its relationship to endocrinology. He referred to a previous communication of his in which an effort was made to elucidate the significance of hemorrhage in the human *corpus luteum*. At the meeting of the British Medical Association in Dublin in 1933 Professor Novak had stated that Hartman's views with regard to an

active substance derived from the anterior pituitary gland as a cause of the onset of menstrual bleeding had been abandoned. He (Dr. Falkiner) had endeavoured to show that in the human *corpus luteum* the onset of hæmorrhage in the uterine mucosa was accompanied by a synchronous hæmorrhage in the *corpus luteum*. That, to his mind, explained the very rapid degeneration of the *corpus luteum* of menstruation. On the other hand, in the *corpora lutea* of pregnancy that he had had the opportunity of examining he had never been able to demonstrate gross bleeding. Novak had not agreed with his interpretation of the series that he had collected. There was no doubt that hæmorrhage occurred in the *corpus luteum* at various stages of its history, and this fact made it very difficult to come to the conclusion that a hæmorrhage seen at the time of the onset of menstruation could be attributed to any specific cause. The one thing that had transpired in his study of the past two years was that no *corpus luteum* from pregnancy had shown the presence of bleeding. The *corpus luteum* had been recognized as having an influence on the mucous membranes of the uterus, and they knew that this was due to its internal secretion, which had been named progesterin. The physiological effects of progesterin were to stimulate the mucous membranes of the uterus to undergo secretory changes. In mammals such as the ungulates the secretory activity of the uterine gland was essential to nourish the ovary, for in the ungulates the placenta was a *placenta epithelio-chorionalis* when the chorion did not invade the maternal blood vessel in forming the placenta. In the human female the chorion formed a very intimate attachment to the uterine mucosa, allowing the maternal blood stream to bathe chorionic villi, and thus the necessity for secretory activity in the uterine mucosa was obviated. Thus it would appear that only in the early weeks of pregnancy was the *corpus luteum* essential for the continuation of gestation. The administration of *corpus luteum* extracts in cases of repeated abortion might be justified on the grounds that the *corpus luteum* affected the contractility of the uterus, rendering it less likely to expel the products of conception.

DR. BRUCE MAYES (Brisbane) said endocrinology had advanced rapidly in the laboratory and slowly in practice. It was essential to make a correct diagnosis as to which gland was at fault. Amenorrhœa in the young girl was generally caused by antipituitary upset, whereas in the premature menopause it was ovarian in origin. Menorrhagia was a disorder due often to *corpus luteum* deficiency, and treatment in these cases was promising with the hormone itself, given by injection but not by mouth. The relation of the endocrines to emotions and instincts seemed to be proved by certain observers.

DR. F. A. MAGUIRE (Sydney) found that amenorrhœa due to pituitary disturbance gave no result with treatment. The subthyroid type, whether characterized by amenorrhœa or menorrhagia, responded to the administration of thyroid. The over-action of the endocrines seemed to produce menorrhagia, whereas the under-action produced amenorrhœa. It was his experience that absence of menstruation clinically made little difference to the health of the patient.

DR. R. F. MATTERS (Adelaide) said that follicular rupture occurred fourteen to sixteen days prior to menstruation. The basal metabolic rate was increased by pregnancy. In investigating the parathyroid activity in relation to the menstrual cycle, he found there was no alteration in the blood calcium during this period, but that there was a rise in the later months of pregnancy. Experiments on rats proved a definite interrelation between adrenal and ovarian hormonal activity. In treatment, if prolactin was being used, it should be standardized regularly, as it became inert comparatively quickly.

PROFESSOR J. B. DAWSON (Dunedin) said that gynaecology and obstetrics should be practised together, and in interpreting the term gynaecology he preferred "lore of women" to "diseases of women", thus divorcing its practice from that of general surgery.

DR. J. S. FAIRBAIRN, the President, asked Dr. Maguire to amplify his remarks that thyroid deficiency gave both

amenorrhœa and menorrhagia, as it was his experience that in these cases menorrhagia occurred first, and later amenorrhœa.

DR. EDWARD WHITE (Melbourne) stated that the one-child mother was often of the subthyroid type and, if treated as such, often produced other children. In the case of women in the middle thirties suffering from menorrhagia he preferred to treat them on general medical lines, aiming to improve their general bodily physical and mental tone.

PROFESSOR R. MARSHALL ALLAN, the Chairman, before calling on Dr. Falkiner to reply, stressed the necessity for keeping gynaecology a pure science, to be practised by gynaecologists only.

Dr. Falkiner, in reply, stated that the Aschheim-Zondek test was the reward of endocrinological investigation, but the results of glandular therapy were a disappointment.

Dr. Maguire, in reply to the President, stated that he always taught that menstrual function varied in inverse ratio with thyroid activity, but investigation of his case records showed that he did not always observe this.

Heart Disease Complicating Pregnancy.

DR. H. C. E. DONOVAN (Sydney) had prepared a paper dealing with some aspects of heart disease complicating pregnancy. He was prevented by illness from being present, and his paper was read for him by Professor J. C. Windeyer (Sydney). Dr. Donovan's paper was based on impressions of patients seen in hospital and private practice, and on an analysis of 52 patients treated at the Women's Hospital, Sydney. During the period under review the number of deliveries in the hospital had been 20,306. Among the 52 patients there had been two deaths. Seventeen had had Cæsarean section, in three instances labour was induced, four had had therapeutic abortion by the vaginal route or abdominal hysterotomy. The remainder had had natural labour, but in most instances the second stage was shortened by the application of forceps. The most common heart lesion encountered was mitral stenosis; other lesions included myocardial degeneration (in elderly *primipara*) and three cases of congenital heart disease, aortic stenosis and aortic regurgitation. In his conclusions Dr. Donovan stated that most patients with heart disease were capable of successful pregnancy. Therapeutic abortion was indicated principally for reinfection during the pregnancy, for the few patients who were getting worse in spite of treatment in bed, digitalis and so forth, and for those patients who were suffering from the more severe forms of aortic disease and congenital heart disease. In deciding for or against Cæsarean section the general and obstetric history and the capacity for household work were the main points on which to base a decision. A surgically induced labour might be, and usually was, more trying than normal labour; the risks were less easily calculated than those of section. Surgical induction of labour was rarely good treatment after three months' gestation. The purely operative risks of Cæsarean section had been so much reduced by the lower segment operation and by the newer antiseptics, especially "Dettol", that operation could be undertaken with more confidence.

DR. CRIGHTON BRAMWELL (Manchester) stated that prognosis in heart disease associated with pregnancy should be based on the result of very carefully recorded cases. He asked: (i) What was the immediate additional risk to the mother of pregnancy superimposed on cardiac disease? (ii) What was the risk of permanent damage to the mother's heart by the pregnancy? He did not agree with the previous speaker that congenital heart lesions were an indication for the termination of pregnancy, as, in his opinion, the patients went through the pregnancy without any untoward effect. He did not take much notice of valvular lesions *per se* in prognosis, but he looked upon an auricular fibrillation or a history of heart failure with engorgement prior to pregnancy, as definite indication for termination of the pregnancy, and he advised such patients never to become pregnant again. The method of terminating pregnancy he left to the obstetrician, insisting,

however, that the patient should be "rested" in bed and that the fibrillation or cardiac failure should be treated. In estimating the effect of pregnancy on a heart that had been damaged by rheumatic infection, he pointed out that, as rheumatic heart disease was progressive, it was most difficult to arrive at a final determination. In all other cases of heart disease associated with pregnancy he preferred to allow the pregnancy to progress under strict supervision, watching for and treating any cardiac failure, as in these cases prompt treatment often brought about a good result. He advised that the second stage of labour should be shortened by forceps delivery when the os was fully dilated.

SIR EWEN MACLEAN (Cardiff) advocated the formation of standards both for the treatment and for the indication of termination of pregnancy in cases of cardiac disease. On investigating 52 patients with heart disease admitted to the Cardiff Royal Infirmary, he had come to the conclusion that antenatal treatment was essential, that the age of the patient influenced prognosis, and that *multipara* had a worse prognosis than *primipara*, that those patients with large families had a worse prognosis than those with small families, that mitral stenosis was the commonest lesion, and that congenital heart affection had a good

prognosis. In treatment he advocated rest in bed before delivery as being very important. Patients with heart failure should have the cardiac lesion treated first, and morphine and hyoscine should be given during the first stage of labour, and patients should be delivered by forceps when the os was fully dilated. He found that there was an increased foetal mortality when the mother suffered from cardiac disease, and that surgical induction of labour did not seem to upset the heart further when it was properly treated before induction was attempted.

DR. J. B. BANISTER (London) stated that congenital heart lesions did not increase the risk of pregnancy to the mother. In his opinion, one attack of heart failure was not sufficient evidence upon which to empty the uterus, but it was necessary to have recurrent attacks. He would like to stress the danger to the mother in the second week of the puerperium, as in his experience many died suddenly during this period. He subordinated obstetrical to medical treatment.

PROFESSOR R. MARSHALL ALLAN, the Chairman, advocated treating the heart condition first, then dealing with the pregnancy later. By doing so, the results, in his experience, were satisfactory.

Section of Radiology and Radio-Therapeutics.

President: H. M. Moran, M.B., F.R.C.S., F.R.A.C.S. (Sydney).

Vice-Presidents: L. J. Clendinnen, M.B., B.S. (Melbourne); R. A. Gardner, M.B., D.M.R.E. (Cairo); Major D. B. McGrigor, O.B.E., M.B., D.M.R.E. (Frinton-on-Sea); D. I. R. Smith, M.B., B.S. (Western Australia).

Honorary Secretaries: F. G. Stephens, M.B., B.S. (Melbourne); F. G. Mackay, M.B., F.R.C.S., D.R.E. (Melbourne).

The Treatment of Mammary Cancer.

DR. H. M. MORAN (Sydney) opened a discussion on the treatment of mammary cancer. He said that it should be accepted as a fact that, apart from a few highly anaplastic and relatively infrequent types, the overwhelming majority of the widely differing growths did not possess the distinctive quality of radio-sensitiveness in such a degree as to justify the prior expectation of cure by radiation alone. The danger of injury to the underlying lung precluded the effective use of a frontal attack and made tangential irradiation necessary. It was difficult or impossible, except with a protuberant breast, to achieve any considerable degree of cross-firing. The chief result obtained was a reduction in the volume of the tumour, dependent either on the sensitiveness of certain elements or on the vascular changes induced. This shrinking, however, should not be allowed to give the fleeting illusion of a cure. Not infrequently a period of apparent calm was succeeded after an interval of a few months by an increased activity. Any evaluation of the prolongation of life which might appear to have been obtained should be considered in the light of the knowledge of the natural duration of life with untreated breast cancer. Dr. Moran went on to show that if external radiation were supplemented by some form of interstitial technique, complete sterilization of the growth was very rarely, if ever, realized. It was essential that an adequate dose of irradiation should be delivered to the utmost parts of the tumour, and this was an extremely difficult proposition. The idea that by creating a barrage of fibrous tissue around or across the path of a growth it was possible to oppose its march successfully or circumscribe its action was entirely erroneous. The cancer cell that was not immediately or shortly destroyed, would continue to threaten the security of the patient, and an associated fibrosis merely frustrated the radiotherapist, for whom fibrous tissue must represent

a degradation of the stroma and a hindrance to cure. The defect of interstitial technique, when dealing with any but small areas, was the risk of leaving a loophole in a widely flung net. Dr. Moran concluded that no valid claim could be made for the routine use of radiation therapy in the treatment of primary growth in substitution of an operative procedure. There was one contraindication to the practice of surgery, and that was the existence of a rapidly growing, highly malignant carcinoma, especially when it occurred in pregnancy or during the puerperium; surgical intervention quickened the pace and extended the line of attack.

Dr. Moran went on to show that in the treatment of metastases the superiority of radiation therapy was clearly defined, though the sum of its achievement was to be reckoned less in lives redeemed than in relief of pain and the postponement of death. Most metastases responded to irradiation. Those distant metastases that resisted irradiation were: (i) those in the lungs and pleura, (ii) the cross-spread of cancer to the other breast, (iii) cerebral metastases, (iv) metastases of the liver and other viscera.

Dr. Moran then discussed radiation as an auxiliary to radical operation. He held the opinion that the scope and value of post-operative irradiation were extremely limited. With unskilled and inexperienced radiotherapists the risk of doing harm was greater than the likelihood of any increased insurance against local recurrence, for the radiotherapist could fan to fierce activity the slow fire of a malignancy. For pre-operative irradiation a much better case could be made out. On theoretical grounds alone properly applied X radiation delivered two or three days before the operation should render surgical intervention safer, because of the restraint put on a far-flung cancer invasion. Preliminary irradiation was designed merely to lessen the danger of scattering that must be inescapable in an extensive dissection. At the same time the surgeon

should not be deceived by any reduction in volume or newly acquired mobility following the X radiation. The breast which had been deemed inoperable should always be considered inoperable. The present aim should be to look for guidance as to the best method in each case from a consideration both of the morphological characters and the clinical history. Since there was neither unity of structure nor of behaviour in mammary cancer, there could be no uniformity of treatment.

DR. R. A. GARDNER (Cairo) thought that the treatment of carcinoma of the breast from the radiologist's point of view was often hopeless. Palliation of the patient's condition could in most cases be secured, and more particularly when metastasis had taken place to the bones. In regard to damage to the underlying lungs, the possibility of fibrosis was materially influenced by the filter employed. He asked Dr. Moran what he considered the optimum voltage for the treatment of the breast, having regard to the fact that the production of higher voltages was extremely costly. He also asked what was the mechanism whereby pre-operative radiation produced its beneficial effect when operative removal was carried out within two or three days.

DR. E. KAYE SCOTT (Melbourne) stressed the difficulty of the diagnosis of small breast tumours, the nature of which was often in doubt. As the ordinary biopsy was often the source of subsequent radionecrosis, he indicated his preference for the punch method, recently advocated in America. He also laid emphasis upon the necessity of insuring a homogeneous radiation distributed over the whole area included in the typical Halstead surgical operation. Dr. Scott showed lantern slides to demonstrate his method of radiating the whole breast and its glandular drainage area by means of radon needles, intensity 1.5 millicuries per centimetre and 0.8 millimetre of platinum equivalent filter. In cases of glandular recurrence it was necessary to irradiate the whole glandular area, and no attempt should be made to treat individual glands by this means. Radium treatment alone was considered inadequate for large breast tumours, and X ray therapy was employed in addition. The following factors were used: 200 kilovolts, a filter of 2.0 millimetres of copper, and four ports of entry, each port receiving a dose of 800 to 900 r units (international).

DR. E. H. MOLESWORTH (Sydney) made a plea for the administration of an adequate dosage to the affected part, stating that he considered the beneficial margin between effective and ineffective radiation to be so small that none of it could be sacrificed. An erythema was a desirable and satisfactory outcome of any course of treatment. Irradiation of the breast could be divided into pre-operative and post-operative courses. Pre-operative irradiation could be delivered by a fractional method involving large doses and a delay of two months before surgical removal could be carried out, this delay being necessary to allow the reaction to subside. On the other hand, a trial was being made of massive doses administered to two aspects of the breast on two successive days, with immediate operation afterwards. Post-operative radiation should always be given with complete and adequate dosage six weeks later. His procedure was to give 250 r on alternate days through two ports of entry, directed according to Finzi's cross-fire method. The total of 1,500 to 2,000 r was administered to each field; after fourteen days' interval the breast was again resaturated with doses of 250 to 400 r. This usually caused a moderate erythema and some desquamation.

DR. A. T. NISBET (Sydney) referred to the necessity for skilled pathological assistance to estimate the nature of the changes resulting in the irradiated cell, and advocated the efficiency of methods involving higher filtration.

DR. W. H. CUSCADEN (Melbourne) was interested in the question of the association of pregnancy with breast carcinoma. He asked whether abortion should be procured or whether radon should be used, the patient being allowed to go to term; it was his practice to follow the latter course. He also said that operative difficulties in surgical

removal of the breast were not increased by previous irradiation three months before. In most of these cases, however, the breast on examination was found to contain carcinoma cells.

DR. MORAN, in reply to Dr. Gardner, said that the higher voltages increased the depth dose, and therefore the danger to the lung, though much of the so-called radiation fibrosis was in reality lung metastasis. The virtue of massive irradiation immediately preceding operation lay in the fact that those cells which were not killed were inhibited, the risk of dissemination at operation being thus reduced. Dr. Moran disapproved of the punch method advocated by Dr. Kaye Scott as fraught with danger, and thought that the only safe biopsy was a complete removal of the tumour mass preceded by radiation; an immediate examination should be made and radical surgical removal of the whole breast should be undertaken if it were clinically or pathologically malignant. He thought that previous complete fractional irradiation produced some difficulty in subsequent surgical procedure if the procedure was left for a couple of months; he was now beginning to believe that it was preferable to operate immediately after irradiation before the full tide of reaction set in. He agreed with Dr. Cuscaden that there was no indication for abortion on pregnant patients suffering from carcinoma of the breast.

Radiation Treatment of Carcinoma of the Tongue.

DR. R. A. GARDNER (Cairo) opened a discussion on the radiation treatment of carcinoma of the tongue. He said that the tongue was a common site for carcinoma in males. Male patients preponderated in Great Britain, though in the Philippine Islands, of 21 reported patients, 14 were females. The disease was productive of dreadful mutilation, but a revolution in treatment had followed the introduction of radiotherapy. This was a purely local method of removal, and its differential destructive action was the greater the more undifferentiated the tissue and the more frequent the mitosis. The disease, before its extension to regional glands, was eminently curable, if sufficiently radiated. It was uncommon for the sense of taste to be influenced by radiation, though a common dryness of the mouth was evidence that radiation did affect the salivary glands. It might be said that the less differentiated the growth, the greater the response to radiation, but such advantage was more than counterbalanced by the increased risk of early dissemination. The histological picture was apparently no certain guide to the response that might be expected. Biopsy, if performed by means of a small snare and with a diathermic current of very high periodicity, was a safe procedure. Little distress was caused to the patient, the trauma was very slight, and the tissues were instantly sealed. The tissues were coagulated to a very small depth only; and small portions of the growth thus removed from the growing edge would permit of the preparation of suitable sections for study.

Buccal hygiene, involving the removal of septic teeth stumps or of dead teeth should be instituted before the implantation of radio-active sources; when carious teeth were allowed to remain, the tongue should be packed away from the jaw with gauze. In irradiating primary growths of the tongue, several methods were possible. There was a choice of interstitial, surface or distance methods of using radium or radon, or Röntgen rays at varying distances. The interstitial methods of Dominici involved the use of the radio-active material in a metal container which was embedded in the tissues. Gamma radiation from radium C ($C''C'''$) obtained from radon gas was employed for the purpose. "Seeds" contained radon gas and were filled from an external producer, namely a radium salt in solution. "Needles", hermetically sealed, contained within them the radium which produced radon gas, and this changed to radium C, the origin of γ radiation. In using seeds, it had to be remembered that their radiation intensity, relatively strong at first, diminished to a fraction of its original strength by the end of a week, while with radium needles uniform intensity of radiation persisted throughout the period of treatment. Seeds could be made in much smaller sizes than needles, and it was possible to utilize a greater proportion of their length

than could be used with a needle, the active length of which was much less than its total length.

Small lesions might be treated by the use of surface applicators in the form of rings or hollow squares. Distance radium was not conveniently applicable to the treatment of primary lesions in the tongue. The needles employed by Dr. Gardner were of low linear intensity (0.66 milligramme per centimetre). Interstitial implantations should always be made at a point well outside any induration or deformity, and the radiation should be planned so as to be certain that the whole volume chosen as definitely enclosing the tumour would be radiated as uniformly as possible. An approximation to the required dosage would be reached by allowing one milligramme of radium element per cubic centimetre of such space. Properly placed needles would radiate the margins of the growth and the area outside them, including healthy tissue, enough to insure that the radiation at the growing margin and to a safe distance beyond it was uniform. As to the fixing of needles in the tissues, Dr. Gardner recommended that the thread attached to the needle should be led to the same side as that to which the point of the needle was directed, when the needle would not become displaced. Threads so disposed might be grouped and fixed with a single stitch to the tongue, or strapped to the cheek after having been led through a fine rubber tube. In inserting needles, the eyes should penetrate to a point just below the mucous membrane.

Referring to the advisability of packing the tongue away from the jaw in cases in which much radium was disposed on the lateral margins of the tongue, Dr. Gardner pointed out that although the use of lead was sometimes advised, any practicable thickness of lead was of little value. If five millimetres of lead were used, the reduction of the hard γ rays was less than 25% and the lead emitted a very caustic radiation at the surface in contact with the jaw. Much better protection was afforded by a hollow vulcanite box affixed to the teeth or jaw.

Radiation of the tongue by Röntgen rays, continued Dr. Gardner, was technically difficult and the favourable results seemed to be merely temporary. Latterly, Chaoul, of Berlin, had employed a Röntgen ray tube operated at a very short distance from the part treated. His results indicated that the method was one worthy of further investigation. At present, however, the special applicators required, which were attached to shock-proof tubes with unipolar grounding, were manufactured in only one European country. Chaoul's technique had the advantage over interstitial or radium puncture radiation that it did not injure the tumour and lessened the risk of metastasis.

Dr. Gardner lastly discussed the difficult question of treatment in cases of glandular involvement. Ablation, he considered, was still as good a method as any, provided the removal was thorough. Uniform radiation by implantation of radio-active sources was not easily accomplished, owing to considerations of space and of the shape of the gland-bearing areas. The skin toleration also imposed limits to Röntgen radiation. Even fractional radiation of low intensity might cause irritation and prevent the use of dosages sufficient to eradicate the malignant glandular tissue. The satisfactory feature of radiation treatment of lingual carcinoma was that it caused no mutilation. In all cases, too, it at least resulted in the palliation of distressing symptoms.

DR. KAYE SCOTT (Melbourne) pointed out that multiple lesions were liable to occur in the tongue; after removal of one tumour the aetiological factors remained. One problem in treatment was the extensive woody tongue invaded by an infiltrating carcinoma. This type was liable to break down after radium therapy and was sometimes best left alone. His practice in lesions of the posterior third was to use long bent radon needles passing over and through the posterior curve of the tongue, thus giving easier access and better distribution of the radiation. He had never seen complete resolution of metastatic glands after X ray therapy alone, though palliation might occur. His practice was to radiate glands and tongue at the same time with radium or radon needles; a pack was now never used, owing to its deficient depth dose and adverse effects upon the skin. The whole glandular drainage area

was treated with radium or radon needles on a systematic plan, and no attempt was made to treat individual recurrences.

DR. H. M. MORAN (Sydney) agreed with the general conclusion of the paper, but thought it unwise to dispense with the fixation suture in the radium needle. Success depended upon the size, site and histological nature of the primary lesion. If the tumour was large, extension to the bone and to the floor of the mouth rendered irradiation difficult. If the tumour was undifferentiated, metastasis to the cervical glands occurred early and destroyed the chance of cure, even though such lesions were fairly radiosensitive. Most cures thus came from the anterior two-thirds of the tongue. Owing to the mechanical difficulties of implantation in the posterior region of the tongue, he considered that some such procedure as Coutard's technique in X ray therapy was to be preferred to interstitial radium implantation, though possibly the latter might be used as an adjunct. Failure to appreciate the extent of the growth was a fruitful cause of radiation failures. Carcinoma of the floor of the mouth was exceedingly difficult to treat with radium, owing to the liability to cellulitis of the tissues of the neck. He agreed with Dr. Gardner that it was not necessary to remove surgically defective teeth, and in most cases it was dangerous to do so, owing to the liability to subsequent radionecrosis. Complete surgical removal of glandular metastases was practically impossible, and radiation was almost always ineffective alone. Cures sometimes occurred with external irradiation plus implantation of radium needles, with open exposure of the affected regions. He agreed with Dr. Kaye Scott that the whole glandular area could be irradiated and individual glands left to take care of themselves.

DR. A. T. NISBET (Sydney) stated that for glandular metastases it was possible, by using 275 to 300 kilovolts, filtered through two millimetres of copper, to give to each side of the neck 3,500 r in sixteen days.

DR. VAL McDOWALL (Brisbane) had found that after treatment of a tongue lesion on one side, with removal of the glands on the same side, recurrence was liable to occur some years later on the opposite side of the neck. He thought that the use of Chaoul's method was a retrograde step.

Radiological Diagnosis in Diseases of the Lung.

DR. J. G. EDWARDS (Sydney) opened a discussion on radiological diagnosis in diseases of the lung. He said that the paper was not intended to deal with the ordinary routine pulmonary examination, with which all members were familiar, but to bring forward various puzzling conditions which were likely to be met with in the everyday life of the radiologist. Particular stress was laid upon the industrial condition of silicosis. Dr. Edwards pointed out the need for cooperation between the physician and radiologist, suggesting that each should make an independent examination and then meet in consultation. If either was aware of the other's findings, he might be biased in his own observations. Every opportunity should be seized to study the normal, otherwise it was not possible to interpret the abnormal.

In regard to technique, it was considered that the stereoscopic postero-anterior films gave practically all the information available, and lateral films need be taken only when the postero-anterior films called for them. Fluoroscopy should be reduced to a minimum, as it was dangerous to observer and patient, and the information gained was only of minor importance; it was of value in the localization of lesions and in determining the amount of diaphragm movement, and also in checking lipiodol instillations and artificial pneumothorax. Dr. Edwards laid emphasis on the importance of visual accommodation in fluoroscopy and said that no screening should be attempted until the observer had been in complete darkness for ten minutes by the clock. Films should be taken at a distance of seven feet, three hundred milliamperes of current being used at kilovoltages of from fifty to seventy. He did not recommend the Potter-Bucky diaphragm and Lysholm grid, as they exaggerated detail and gave too violent contrast.

Various interesting conditions were then described and were illustrated by lantern slides. Apical scarring was frequently seen and was probably due to healed tuberculous lesions; they were of no clinical significance and never seemed to break down or to give rise to other tubercular deposits. Irregular pleural effusions were discussed and slides were shown of interlobar effusions of various shapes, and of mesial effusions; the latter were frequently associated with some lesion of the oesophagus. Attention was also drawn to the irregular shapes which hydatids might assume when occurring in the pleural sac; an important point in the differential diagnosis between hydatid and basal effusion was the depression of the diaphragm and liver in the former condition.

Dr. Edwards then dealt with the condition of bronchiectasis and the importance of proper technique in the instillation of lipiodol; he considered the supraglottic method superior to the transcricoid, as in the latter it was very easy to inject the fluid into the areolar tissues of the neck. As little lipiodol as possible should be used, for it was very easy to "drown" a section of the lung; lipiodol often remained in the lung for years and caused trouble in diagnosis, as it sometimes gave appearances very like those of tuberculosis or silicosis.

Fibrin bodies were seen as rounded shadows on one side of a chest which had been the site of a pneumothorax. The fluid coagulated and was churned into ball-like structures. They were frequently diagnosed as malignant, but malignant changes were usually bilateral; as the lung expanded these bodies gradually disappeared, leaving no trace.

Fungal infections had rarely been seen by Dr. Edwards; yeast infections gave an appearance like bronchopneumonia with tremendous dyspnoea; actinomycosis caused a localized consolidation which extended in all directions, crossed the interlobe and invaded the chest wall, giving rise to a characteristic boggy oedema of the skin and subcutaneous tissues.

Tuberculosis received only passing mention, Dr. Edwards pointed out that in adults practically all lesions occurred in the upper half of the chest; it was not always possible to state whether a tuberculous lesion was active or quiescent, but when lesions were sharply defined or calcified the condition was probably quiescent.

Dr. Edwards dealt with silicosis at somewhat greater length. He said that the present opinion was that an inhaled dust was dangerous only in proportion to its silica content. Silicates did not seem capable of producing a nodular fibrosis, but sericite might act as an accelerating agent when associated with silica. Hawkesbury sandstone contained 80% (or more) of silica, metalliferous ores from 20% to 40%, and coal about 4%; it had to be remembered, however, that coal-miners were frequently cutting through rock, and in some mines stone dust was blown in to carry down the light coal dust, which, when suspended in air, was likely to cause explosions. Individual susceptibility, damaged pulmonary lymphatic circulation, and preexisting pulmonary disease all played a part in determining the time of onset of the disease. It was impossible to estimate the sufferer's disability from an X ray film alone, as with most advanced mottling on the film the patient might show little disability, yet with little film change a man might be considerably disabled. Only the smallest particles of dust entered the alveoli (less than five microns in diameter) and the mechanical irritation of these particles was of little moment. The nodular changes were due to irritation from a chemical substance formed by the solution of silica in the body fluids; coal particles of similar size did not go into solution, but were carried by the phagocytes to the nearest lymph node; the silica produced nodules which were similar to tuberculous nodules, but they did not tend to coalesce, nor did they go on to caseation. Silicosis showed on the film as a symmetrical, fine, nodular fibrosis, commencing in the perihilar regions and gradually extending to the periphery; marked increase in shadows at the apices pointed to a superadded tuberculosis. Most of these sufferers died from a superadded tuberculosis. Once established, silicosis progressed, even if the man was removed from his dusty occupation. The diagnosis between an ordinary tuberculosis and silicosis

was easy, but it was not possible to differentiate between silicosis and miliary tuberculosis from the film alone. In tuberculosis there was a rise in temperature, this being absent in silicosis; in tuberculosis there was a tendency for the nodules to coalesce and to caseate. The fibrosis seen in catarrhal conditions was more of a streaking along the bronchial tree and not a nodular type of fibrosis.

Dr. J. O'SULLIVAN (Melbourne) stressed the importance of consultation between the physician and the radiologist in all cases of chest disease, since diagnosis was sometimes impossible from a study of the film alone. As regards X ray technique, he favoured the use of higher voltages than most radiologists and exposed his chest films through an anti-diffusion grid of the Lysholm type. The softer rays generally used failed to show the lung detail behind the ribs and mediastinal contents. Stephanl, of Switzerland, used up to 150 kilovolts peak, with a rotating Siemens grid. Dr. O'Sullivan deprecated the tendency of manufacturers to stampede radiologists into the purchase of high milliamperage apparatus for the examination of chests. For the introduction of lipiodol he favoured the insertion of a catheter through the anesthetized larynx, placing the patient at various angles to determine the flow of the opaque medium.

Dr. B. L. W. CLARKE (Brisbane) referred to the danger of examining patients by the fluoroscopic screen, both from the point of view of X ray exposure and of that of tuberculous infection from patient to doctor. In his opinion, about 250 milliamperes was the most suitable current for the production of X ray chest films. Every radiologist, he thought, should personally examine his own patients, and in support of this contention instanced a case in which no less than eight physicians had failed to discover a carcinoma of one breast.

Dr. A. J. COLLINS (Sydney) stated that he placed himself in the hands of the radiologist, and as a physician never felt competent to treat a patient with chest disease without the cooperation of the radiologist. He indicated that the radiological estimation of the activity of a tuberculous lesion was difficult and that the conclusions of the radiologist in this respect were often erroneous, more particularly in regard to small lesions. Absence of X ray evidence of tuberculosis following expansion of a lung after pneumothorax did not exclude a possible small and active focus of disease. There was considerable difficulty in distinguishing small healed and calcified lesions from early infiltrations in which calcification was sometimes the first X ray evidence of commencing disease.

Dr. F. J. GWYNNE (Auckland) located pus by bronchoscopic examination, removed it by suction and then injected the lipiodol into the affected region alone. The possibility of "drowned lung" was thus to a large extent avoided.

Dr. C. BADHAM (Sydney) thought that radiologists should adopt a much broader outlook in cases of pneumoconiosis. It was essential to recognize that the pathology of dust diseases was on very poor footing. Until they could produce in animals a similar condition to that seen in man, they should be cautious. In regard to Sydney sandstone dust, he did not think that sericite was an important factor. In the interpretation of radiographs the radiologist had to consider that the causal factors were very imperfectly known and that there was ample scope for further investigation.

Dr. Edwards, in reply, agreed with Dr. Gwynne's technique for lipiodol injection, and in addition stressed the advisability of draining the lung by the assumption of postures immediately afterwards with the head lowered. In regard to the study of the normal, which was so important, he explained that the appearance of the films varied considerably, according to the milliamperage used. In reply to Dr. Collins's query, his answer was that the radiologist should not be dogmatic, but should be guided by the accompanying clinical data.

The Diagnosis of Bone Tumours.

Dr. H. R. SEAR (Sydney) opened a discussion on the diagnosis of bone tumours. He first showed slides of the more common bone tumours and allied bone lesions,

including osteoma, enchondroma, cartilaginous dystrophies, such as Ollier's disease, bone cyst and fibrocystic variations, osteogenic sarcoma, Ewing's tumour, hæmangioma, giant-celled tumour; but did not discuss them in any detail. Before discussing the lesions more difficult of diagnosis, he emphasized the importance of a history, maintaining that the radiologist was a consultant and that any material that was available, such as the result of the Wassermann and Casoni tests *et cetera*, should be placed at his disposal, and also that the radiologist should be entitled to make any further radiographic examination that he thought essential, for example, in massive skeletal lipid histiocytosis.

For ease of discussion Dr. Sear arbitrarily divided the difficulties into four main groups: (i) periosteal, (ii) cortical, (iii) central, and (iv) composite; and he illustrated the difficulties with sixty lantern slides. Among the periosteal difficulties he discussed: (i) Secondary deposits from primary bronchogenic carcinoma, dealing with hypertrophic pulmonary osteoarthropathy, the bastard type of hypertrophic pulmonary osteoarthropathy occurring especially towards the ends of the long bones, and the isolated secondary deposits occurring in this condition. Dr. Sear illustrated how they might be mistaken for sarcoma and how they might present a slight "soap bubble" appearance similar to, though less marked than, that in secondary hypernephromata in bones. (ii) The rare, relatively benign extraperiosteal fibrosarcoma in which the bone change was a pressure defect and not an invasion. (iii) Early secondary neuroblastoma deposits in the long bones; he emphasized that in the early stages all that might be seen was some periosteal reaction with, at times, slight "lipping". (iv) The "lace-work" type of specific periostitis, which had to be differentiated from osteogenic sarcoma.

Among the cortical difficulties Dr. Sear showed how similar radiographically the cortical type of hydatid was to osteogenic sarcoma; but he illustrated how at times it could be diagnosed by the calcification in the cyst wall. He stated also that lymphadenoma of bones was much more common than was generally supposed, and might be extremely difficult to differentiate, though its ready response to irradiation should arrest attention. Finally, the typical "soap bubble" effect of secondary hypernephroma was illustrated, and it was pointed out that these secondary deposits might be both cortical and central.

In the central group Dr. Sear discussed and illustrated: (i) central hydatid, with its extension up and down the medullary cavity; (ii) lipid histiocytosis, of the massive skeletal type, and how it simulated fibrocystic disease; (iii) central cartilaginous masses and tumours, such as myxochondrosarcoma; (iv) secondary hypernephroma with expansion and characteristic "soap bubble" appearance.

In lesions of more composite involvement Dr. Sear discussed Ewing's tumour in relation to osteomyelitis, syphilis, Garré's sclerosing non-suppurative osteomyelitis; and he showed how, if one bone only was examined by X rays, Engelmann's disease might simulate these lesions. In Paget's disease he referred to the "stringy", the "lumpy" and the "sclerotic" types, how the "lumpy" type might be difficult to separate from secondary deposits from a prostatic neoplasm. He discussed how low in Australia a percentage of patients with Paget's disease developed sarcoma—less than 2% in many hundreds of cases, compared with 14% in America (Codman) and 5% in Europe (Holzknecht). He emphasized the need for careful examination of the cortex to exclude the possibility of overlooking an early sarcoma supervening on Paget's disease. Finally, Dr. Sear pointed out that lipid histiocytosis might occur at the ends of long bones, close to the joints, and might be mistaken for tuberculosis. He then showed a series of slides demonstrating the wide variety of appearances that might occur in secondary neuroblastomata in the long bones, and mentioned the possibility of mistaking it for osteomyelitis.

DR. VAL McDOWALL (Brisbane) emphasized the need for the accumulation of all the data possible in every case of bone tumour, including the fullest history, with clinical and pathological findings. By this means only could the radiologist be enabled to arrive at a correct conclusion.

There was a distinct necessity of educating the medical profession in this respect. Personally he first excluded inflammatory disease of bone, but considered that the diagnosis was difficult. He drew attention to the chaotic condition of the nomenclature of bone neoplasms and paid a tribute to the clarifying work of the American Registry of Bone Sarcoma in this direction. He concluded with the suggestion that the profession in Australia should combine to collect information on bone neoplasms on the same lines as the American institution.

DR. COLIN MACDONALD (Melbourne) stressed the necessity for the correlation of radiological, pathological and clinical findings in bone neoplasms. He thought that the importance of pathology to the radiologist could not be over-rated, and in particular outlined the changing viewpoint of the pathologists, whereby many so-called sarcomata were now classed as anaplastic carcinomata. In regard to Ewing's tumour of bone, he had seen only two cases at the Children's Hospital, Melbourne, and asked Dr. Sear whether he had found them more frequent in Sydney. Single bone cysts, he considered, had no connexion with hyperparathyroidism, and were probably degenerated neoplasms. Each year he grew more cautious about interpreting a bone lesion from X ray films alone. He considered it preferable to delay his opinion and to collect full data rather than to imperil intellectual honesty by a rash diagnosis.

DR. H. PHAAGST (Melbourne) pointed out that the usual incidence of Ewing's tumour was in the long bones. In spite of this, he had seen four primary tumours of this nature in the ribs during the past year. Slides were demonstrated showing that some of these presented a large rounded mass projecting into the lung field and rather resembling a pleural tumour. He considered hydatid disease of bone to be rather rare, having seen only nine cases in ten years. One very interesting point was that in many of these the Casoni test gave no reaction.

Dr. Sear, in his reply, warmly supported Dr. Val McDowall's suggestion for an Australian organization on the lines of the American Registry of Bone Sarcoma. In reply to Dr. MacDonald, he agreed that Ewing's tumour in children was rare. Most cases that he had seen in the ribs were in elderly people.

Training in Radiology.

DR. D. B. McGRIGOR (London) opened a discussion on the subject of training in radiology. He first of all drew attention to the progress of radiology during the last twenty-five years, and then discussed the place of radiology in the medical curriculum. The curriculum was again in process of change, and in the reformed curriculum the training of medical students in radiology would probably have a place. The Curriculum Committee of the General Medical Council had made recommendations in that direction. In the preliminary instruction on science subjects attention should be paid to radio-activity; attention should also be directed to what might be termed living anatomy and physiology, as revealed by X rays. Furthermore, accurate terminology should be taught from the beginning. Dr. McGrigor referred to requests to "do an X ray", and he pointed out that care should be taken to discriminate between a radiologist (a person qualified in medicine and specially trained in medical radiology) and a radiographer (a non-medical assistant specially trained in X ray photography and the use of apparatus).

In regard to the qualifications of a radiologist, Dr. McGrigor said that the first thing was to insure that it was the right kind of man who had taken up the subject. He should be a man of more than average constitution, to meet the physical demands of radiological practice; he should have a mind for mechanics, science and practice, the personality, mental ability and manual skill adapted to the requirements of radiology; and, above all, he should be a good doctor, preferably a physician of qualification and experience. He should, if possible, take a higher degree or diploma. Linguistic ability also was no small asset to the radiologist; in fact, a knowledge of French and German was essential.

Radiologists should always be good radiographers. More attention should be paid to medico-legal aspects of radiology; and post-graduate work and work for higher qualifications should be done at centralized schools, hospitals or clinics, where it would be possible to coopt outside men to teach subjects in which they had specialized.

After passing reference to the training of non-medical assistants, Dr. McGrigor spoke of other ancillary workers. The first that he mentioned were the physicists; but he said that it was the physicists who had educated the radiologists. He thought it would be a Utopian idea that there might be set up a scientific committee of manufacturers and physicists who would place reliable data before the medical profession from time to time. This had been accomplished in Italy under new legislation. Hospital committees also needed educating; and, lastly, the public needed to be educated in regard to what might be expected from radiology.

DR. G. L. BUCKLEY (Bournemouth) pointed out that valuable help was sometimes received from illustrations in the literature, though the quality of the reproduction was often indifferent. She urged the establishment of film libraries, furnished with pathological and other illustrative material. It was essential that the radiologist should have sufficient leisure to attend meetings of the various radiological societies. Dr. Buckley felt concern for the future of radiology in view of the fact that many specialists now tended to do their own X ray work. She believed that the disappearance of the private radiologist would destroy the usefulness of radiology.

DR. KEITH HALLAM (Melbourne) considered that much could be done in the teaching of anatomy to forward the science of radiology, particularly by cinematograph films of the heart and other moving parts. A living, rather than a dead, anatomy would thus be created. Screening for educational purposes he considered dangerous. Embryology was one of the bases of anatomical X ray study, especially in regard to the development of the teeth, kidneys and intestines. He further suggested that radiological training should be carried out by two different grades of instruction, one for general practitioners who owned their own machines, and a second, more complete, course for specialist radiologists. The radiologist should be a man of many parts, of wide clinical experience, and able to assert his opinion without at the same time asserting his personality. Regional anatomy, pathology and embryology with a broad basis of general education were essential. In conclusion he indicated a coming radiological era, when the radiologist would do no technical work, but would confine himself to the consultative and clinical aspects of X ray work.

In reply, Dr. McGrigor stated that he thought it would be an excellent step if radiologists could be graded by some authoritative body on the same lines as in the United States of America. He disagreed with Dr. Hallam that it was not essential for the radiologist to be proficient in the technical branches of X ray work.

The Radiological Examination of the Stomach and Duodenum.

DR. K. S. CROSS (Melbourne) opened a discussion on the radiological examination of the stomach and duodenum. He began by saying that thorough cooperation between physician and radiologist was essential. Each must understand the other's problems. Moreover, the radiologist himself should also be a clinician and pathologist. Besides being specially skilled in a highly technical method, he should command an unusually extensive knowledge of disease and medicine in general, and, in particular, of the radiological manifestations of macroscopic pathology. Many patients exhibited equivocal X ray signs which demanded the fullest interchange of views between the physician and radiologist and consideration of all relevant facts. In any case the radiologist should be supplied with all available data. It was just as unreasonable to ask the radiologist to make a diagnosis without a full knowledge of the history of the case and other clinical facts as it would be to expect the physician to do so without the X ray findings. An X ray report represented a human opinion

and not a machine-made diagnosis. Time should be allowed the radiologist for calm consideration of the case and evaluation of his collected evidence.

In the stomach the outstanding problem was that of the early diagnosis of carcinoma. The majority of gastric cancers when first seen were so far advanced that they readily could have been detected had they been an eighth, a sixteenth, or, in some cases, perhaps a hundredth of their observed size. Statistics had been published to show that, at the time of discovery of the presence of gastric carcinoma, in only one-quarter of the cases was it possible to resect the growth; and, further, that between the onset of symptoms, usually sudden, on the one hand, and the radiological examination and discovery of the condition on the other, an average period of eight to ten months was allowed to elapse. Here then there was precious time to be saved, time that might make all the difference between possible cure and hopeless inoperability.

The radiological detection of early cancer was a technical and altogether different problem, involving the ascertaining of the earliest recognizable radiological signs and the devising of apparatus, methods and procedures for observing and recording such changes, special difficulties presenting themselves at either end of the stomach. Amongst the earliest signs were the disturbance of peristalsis at the site of localized infiltration, and the changes of the mucosal pattern—the erasure of the folds in the scirrhous type and their abrupt discontinuity at the edges of a fungating mass.

In the duodenum there was the problem of determining the presence of ulceration, independent of the deformation which so frequently persisted long after the disappearance of symptoms. Duodenitis, gastritis, gastric ulcers, innocent tumours *et cetera* should also be considered.

Dr. Cross suggested that fundamental matters for determination were: (i) the constitution of a sufficient and not over-elaborate routine method for the radiological examination of the stomach and duodenum; (ii) the additional technique to be made available for determining, as fully as possible, the nature and extent of equivocal abnormalities detected at the first examination, or for further investigating doubtful cases; (iii) the ancillary apparatus most suitable for these respective purposes.

There should be a more general adoption of the principle of reexamination. The Mayo Clinic workers stated that early diagnosis of cancer could be made on repeated reexaminations.

The cost of radiological investigation had always to be considered. It was inherently expensive because of the apparatus required and the materials used. This was particularly so in Australia, where the cost of equipment was so much greater than on the other side of the world. As technique improved and new methods of examination were developed, so would the fee for a thorough investigation tend to rise. The value of the evidence derived therefrom, however, increased in a much greater ratio. Taking it all in all, the amount paid for an X ray examination by a competent radiologist, having regard to the results achieved and the information elicited, was probably the best investment a patient ever made in the realms of medicine. It was the duty of the radiologist, however, both to the physician and his patient, to see that these examinations were not made over-elaborate, and it was with this principle in mind that the above method of procedure was advocated.

DR. H. A. MCCOY (Adelaide) suggested that the adoption of a standard and of a special barium meal examination would lead to failure to diagnose smaller lesions. He reviewed the work of Cole on the examination of the stomach and agreed with Cole's insistence that the silhouette view of the stomach in profile was the sheet anchor of X ray diagnosis. Cole's second fundamental of examination was the investigation of the special mucosal folds of the stomach; his third, the examination of the pliability of the mucosa; and his fourth, the general study of the mucosal pattern or rugæ. In estimating the pliability of the stomach wall Dr. McCoy advocated Frankel's method of multiple exposures on one film. The technical difficulties of demonstrating rugæ were considerable and pitfalls of incorrect interpretation legion. Most

radiological errors in these cases were confined to the cardia, where the need of information was greatest. In particular the radiological evidence of gastritis was unreliable. The demonstration of Cole's first and fourth fundamentals constituted a reliable indication of duodenal ulcer, namely, a deformed cap together with irregularity of the mucosal folds. The demonstration of a "fleck" in the duodenal cap was not a reliable indication of ulcer, unless the fleck was seen definitely and constantly in more than one film.

Dr. JOHN O'SULLIVAN (Melbourne) thought that every patient sent to hospital with a diagnosis of early carcinoma of the stomach should be investigated in as complete a manner as possible, and he deprecated the establishment of a separate standard and special procedures. He thought that elaborate apparatus was not necessary and that the clinical outlook of the radiologist was of far greater importance. He advised air filling of the stomach as a means of demonstrating fungating carcinoma of the fundus. Posturing of the patient with multiple films he regarded as very important for the best results.

Dr. E. W. FRECKER (Sydney) spoke of the necessity for examination with the patient in the horizontal position to demonstrate lesions of the cardia. These were liable to be missed if the films taken did not include the whole of the stomach. He further pointed out that the projection of the apparent so-called perforating ulcer on the lesser curvature was often due to spasm of the *muscularis mucosæ* and did not imply a large and deep ulcer. Operative findings in some of these cases revealed only a superficial ulceration of the mucosa.

(To be continued.)

NOMINATIONS AND ELECTIONS.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Claffy, Francis Patrick Christopher, M.B., B.S., 1933 (Univ. Sydney), 16, Boronia Street, Kensington.
Johnson, Alexander Skeffington, M.B., B.S., 1933 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Post-Graduate Work.

POST-GRADUATE COURSE AT LAUNCESTON.

THE Northern Division of the Tasmanian Branch of the British Medical Association has arranged to hold its annual post-graduate week-end course at the Launceston Public Hospital from November 16 to 19, 1935, inclusive. To suit the convenience of those who are not resident in or near Launceston, as many lectures and demonstrations as possible will be arranged for November 16 and 17. Lectures and demonstrations will be given by Dr. Eric L. Cooper and Dr. Hugh Trumble, of Melbourne. The programme of the course will be published at an early date. Further information may be had on application to the Secretary of the Division, Launceston Public Hospital, Launceston.

COURSE OF INSTRUCTION IN MALARIOLOGY AT SINGAPORE.

THE Health Committee of the League of Nations is arranging for a third course of instruction in malariology, which will commence at the King Edward VII College of Medicine at Singapore on April 27, 1936.

It will be preceded by a preliminary revision course, lasting four days, for candidates with a limited experience

of the subject. The theoretical and laboratory studies will continue until the end of May, after which the candidates will proceed in groups either to Malaya, Java or French Indo-China for a further period of practical field work extending over three weeks. The object of the course is to complete the training of medical practitioners who are engaged, or intend to be engaged, in the work of malaria control in their own countries.

The administrative duties will be carried out by the Eastern Bureau of the League of Nations.

There will be three distinct stages to each course: (i) a preliminary revision course, (ii) theoretical and laboratory studies with practical demonstrations, (iii) practical field studies.

The preliminary revision course is designed for students who have a limited practical experience of malaria, and those who may wish to revise the principles of hematology, protozoology and entomology, and the clinical aspects of malaria. It was introduced to avoid the inclusion of the more elementary aspects of these subjects into the main course, which were not required by the more experienced students. The preliminary course occupies four days, beginning at 8.30 a.m. on Wednesday, April 22, 1936.

The theoretical and laboratory studies of the main course will commence at the King Edward VII College of Medicine at 8.30 a.m. on Monday, April 27, 1936, and will be completed on May 30, 1936.

The practical field studies will commence at the beginning of June, and for this the candidates will be divided into groups, one of which will study in Malaya, one in French Indo-China, and probably another in Java. They will last approximately twenty-one days, during which the student will have the opportunity of becoming familiar with the routine of a malarialogist and the actual application of anti-larval and other anti-malarial measures to field conditions.

The League of Nations is making available a limited number of partial fellowships to candidates who are nominated by their governments, on condition that these governments bear half the cost entailed by their nominees.

Conditions of Admission: The subscription for the theoretical and laboratory course will be 75 Straits dollars, and will be received by the Eastern Bureau of the League of Nations at Singapore. Candidates not attending the preliminary course will be expected to possess a working knowledge of malaria and of the fundamental principles of the contributory subjects, such as hematology, protozoology and entomology. Any further information desired will be supplied by the Director of the Eastern Bureau of the League of Nations, 336, River Valley Road, Singapore, to whom applications for admission to the course should be addressed. These should reach Singapore not later than February 29, 1936; and as only thirty candidates can be admitted, early application is desirable.

A summary of the syllabus of the course may be seen at the office of this journal.

Correspondence.

THE THIRD STAGE OF LABOUR.

SIR: I was amazed to read of the treatment of the third stage of labour as suggested by Arthur Crooke, M.B., B.S., in THE MEDICAL JOURNAL OF AUSTRALIA of September 21, namely by intrauterine pituitary extract. Surely such an unwarranted and dangerous interference with a normal course of labour can receive nothing but condemnation. Not one of the reasons given by Dr. Crooke call for such a method.

How can this method save "valuable" time, and why should there be "for the mother the usual (?) indefinite, disagreeable waiting for finality" when chloroform is available? Surely the time needed for the very necessary preliminary emptying of the bladder after the delivery of

the child, the unnecessary handling of the bruised parts alone, namely, as an authority and probably the originator of the method, whom I quote, mentions—that special bimanual manipulation of the uterus is necessary—the special sterilization of the abdominal skin and re-sterilization of the doctor's and nurses' hands *et cetera* would take ever so much longer than the average time for the natural expulsion of the placenta. Such a procedure would most assuredly be extremely disagreeable to a conscious mother and therefore an apprehensive mother.

And why should there be any "tendency to post partum hæmorrhage" in a well conducted labour?

Nevertheless I am very interested in the intrauterine pituitary method for abnormal labour, and particularly when post partum hæmorrhage becomes uncontrollable. About five years ago I had such a desperate case in a "red-haired" woman, and I wish I had known something about the method at that time.

I will quote a few sentences taken from an article in *The British Medical Journal* of June 29, 1935, page 1317, written by W. F. Rawson, F.R.C.S., M.C.O.G.: "It is not generally known—at least I do not see any mention of it in textbooks—that it is quite easy to inject the fundus uteri through the abdominal wall. . . . Hæmorrhage was alarming. I had been controlling the uterus bimanually for a quarter of an hour when the idea occurred to me to ask the nurse to inject another 10 units of pituitary extract, this time into the fundus, whilst I kept it in good position. The result was highly satisfactory, the organ hardening almost immediately, without any further relaxation of any moment. I believe that this simple procedure in all probability saved the woman's life."

Yours, etc.,

Myrtleford,
Victoria,

September 23, 1935.

A. L. J. PETERS.

CORRIGENDUM.

SIR: In the report of my contribution to the discussion on Dr. Coates's paper, "The Role of Surgery in Certain Vascular Diseases of the Extremities" (*THE MEDICAL JOURNAL OF AUSTRALIA*, September 14, 1935), there are two errors which I should like you to correct:

1. Page 361, column 1, bottom paragraph, first sentence. This should read: "The results of treatment in Dr. Heale's cases of *thrombo-angiitis obliterans* had not been entirely satisfactory." The omission of the word "not" makes the view expressed in this sentence as printed at variance with the results then quoted.

2. Page 361, column 2, second line from top, should read: "(v) relief of pain by the liberal application of anæsthetic ointment to the ulcerated and gangrenous parts."

Yours, etc.,

TOM A. F. HEALE, M.B., M.R.C.P.

55, Collins Street,
Melbourne,
September 20, 1935.

Obituary.

EDWARD WILLIAM BUCKLEY.

DR. E. B. FITZPATRICK, Tamworth, forwards the following appreciation of the late Dr. Edward William Buckley.

Dr. Edward William Buckley, who died recently while on a holiday trip to England, practised in Tamworth, New South Wales, for over thirty years and was one of the best known practitioners in the north. Buckley was a very able man and a very fine surgeon, possessing skill and judgement. In an emergency he quickly knew what should be done and was able to do what was required. Many of his colleagues have to thank him for his help,

cheerfully given, when they found themselves in difficulties. His opinion was often sought by his *confrères* in other towns, and he was in much demand as a consultant. He was an excellent diagnostician and seldom was in error. He was quick to sum up a case and to know if it was serious or otherwise. This faculty was not always to his own interest, because he was not inclined to waste time over a patient whose symptoms were imaginary. Hence at times he was regarded as being "casual". But when the case was urgent Buckley would rise to the occasion, and many times did some wonderful work, which it was not his way to talk about. Altogether he represented that unobtrusive type of practitioner who, had he remained in the cities, would have attained the highest honours. Prior to his departure on his ill-fated journey, Buckley, who was M.B., M.S. (Melbourne), was made a Fellow of the Royal Australasian College of Surgeons.

LAURENCE LINDLEY POLLOCK PATERSON.

DR. IVAN MAXWELL forwards the following appreciation of the late Dr. Laurence Lindley Pollock Paterson.

I should like to be permitted to add a few words in appreciation of my late colleague, Dr. L. L. Paterson. Since 1929 he was one of my clinical assistants in the out-patient department of the Royal Melbourne Hospital, where his kindly manner and unfailing sense of humour cheered and helped so many of the patients. Despite his war injuries, which at times caused him considerable pain, he courageously carried out all his medical duties with the utmost regularity and cheerfulness. Of his outside hobbies perhaps his love of flowers was outstanding, and this interest he passed on to many returned soldiers who were under his care at the Mont Park Sanatorium. His sudden and untimely death leaves a gap in the lives of his friends, who extend their sympathy to his widow.

FREDERICK STANLEY BOOTH.

WE regret to announce the death of Dr. Frederick Stanley Booth, which occurred on September 13, 1935, at Randwick, New South Wales.

The Association of Physicians of Australasia.

THE MARGARET RYAN SCHOLARSHIP IN MEDICINE,
SAINT VINCENT'S HOSPITAL, MELBOURNE.

THE Association of Physicians of Australasia announces that the examination for the Margaret Ryan Scholarship in Medicine will be held in October, 1935. The scholarship is valued at £100 and, in addition, a gold medal is awarded. It is open to medical students from any part of Australia or New Zealand who have carried out their full course of clinical work at Saint Vincent's Hospital, Melbourne. Candidates must have fulfilled, in the final year of their course, all the conditions with regard to attendance at lectures and practical work prescribed by the University of Melbourne for that year. The scholarship is not open to students who have done more than four years' clinical work.

The date of the written examination is Friday, October 25, 1935. The clinical part of the examination will be held at the Royal Melbourne Hospital during the following week.

Further information is obtainable from the Acting Honorary Secretary of the Association of Physicians of Australasia, Dr. S. V. Sewell, 12, Collins Street, Melbourne, with whom applications for permission to enter must be lodged, on the prescribed form, not later than October 10, 1935.

Books Received.

- THE OSTEOPATHIC LESION**, by G. Macdonald, M.B., Ch.B., D.O., and W. Hargrave-Wilson, D.O.; 1935. London: William Heinemann (Medical Books) Limited. Demy 8vo., pp. 183, with illustrations. Price: 7s. 6d. net.
- THE ROMANCE OF OPHIR: THE DISCOVERY OF AUSTRALIA'S FIRST PAYABLE GOLD**, by W. R. Glasson; 1935. Australia: The Leader Printing and Publishing Works. Demy 8vo., pp. 173, with illustrations.
- REPORTS ON CHRONIC RHEUMATIC DISEASES, BEING THE ANNUAL REPORT OF THE BRITISH COMMITTEE ON CHRONIC RHEUMATIC DISEASES APPOINTED BY THE ROYAL COLLEGE OF PHYSICIANS: Number 1**, edited by C. W. Buckley, M.D., F.R.C.P.; 1935. London: H. K. Lewis and Company, Limited. Royal 8vo., pp. 182, with illustrations. Price: 12s. 6d. net.
- THE SEX LIFE OF THE UNMARRIED ADULT: AN INQUIRY INTO AND AN INTERPRETATION OF CURRENT SEX PRACTICES**, edited by I. S. Wile, M.D.; 1935. London: George Allen and Unwin, Limited. Demy 8vo., pp. 342. Price: 7s. 6d. net.
- A TREATISE ON HYGIENE AND PUBLIC HEALTH, WITH SPECIAL REFERENCE TO THE TROPICS**, by B. N. Ghosh, F.R.F.P. and S., revised and largely rewritten with the assistance of A. D. Stewart, C.I.E., M.B., F.R.C.S.E., D.P.H., D.T.M. and H.; Eighth Edition; 1935. Calcutta: Scientific Publishing Company. Demy 8vo., pp. 675, with illustrations. Price: 12s. 6d. net.
- A POCKET MEDICAL DICTIONARY**, compiled by L. Oakes, S.R.N., D.N., assisted by T. B. Davie, B.A., M.D., M.R.C.P.; Second Edition; 1935. Edinburgh: E. and S. Livingstone. Demy 18mo., pp. 386. Price: 3s. net.
- GYNECOLOGICAL AND OBSTETRICAL TUBERCULOSIS**, by E. M. Jameson, B.S., M.D.; 1935. Philadelphia: Lea and Febiger. Royal 8vo., pp. 256, with illustrations.
- THE MEDICAL ANNUAL GENERAL INDEX AND REVIEW FOR THE TEN YEARS 1925 TO 1934: Volume V**; 1935. Bristol: John Wright and Sons, Limited. Demy 8vo., pp. 466. Price: 12s. 6d. net.
- FORMULARIO DE COCINA DIETÉTICA: I: ENFERMEDADES DEL APARATO DIGESTIVO**, by C. Cardini; 1935. Buenos Aires: El Ateneo Librería Científica y Literaria. Royal 8vo., pp. 230.

Diary for the Month.

- OCT. 8.—Tasmanian Branch, B.M.A.: Branch.
OCT. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
OCT. 11.—Queensland Branch, B.M.A.: Council.
OCT. 15.—New South Wales Branch, B.M.A.: Ethics Committee.
OCT. 15.—Tasmanian Branch, B.M.A.: Council.
OCT. 16.—Western Australian Branch, B.M.A.: Branch.
OCT. 16.—Victorian Branch, B.M.A.: Clinical Meeting.
OCT. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
OCT. 23.—Victorian Branch, B.M.A.: Council.
OCT. 24.—New South Wales Branch, B.M.A.: Clinical Meeting.
OCT. 25.—Queensland Branch, B.M.A.: Council.
OCT. 31.—South Australian Branch, B.M.A.: Branch.
OCT. 31.—New South Wales Branch, B.M.A.: Branch.
NOV. 1.—Queensland Branch, B.M.A.: Branch.
NOV. 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.
NOV. 5.—Tasmanian Branch, B.M.A.: Council.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," pages XXIV-XXVI.

- ADELAIDE CHILDREN'S HOSPITAL, ADELAIDE, SOUTH AUSTRALIA:** Resident Medical Officers.
DEPARTMENT OF PUBLIC HEALTH: Medical Officer.
KALGOORLIE DISTRICT HOSPITAL, KALGOORLIE, WESTERN AUSTRALIA: Resident Medical Officer.
LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officer.
ST. MARGARET'S HOSPITAL FOR WOMEN, SYDNEY, NEW SOUTH WALES: Resident Medical Officer.
THE WESTERN SUBURBS HOSPITAL, SYDNEY, NEW SOUTH WALES: Resident Medical Officers.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	
	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	
	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointment and those desiring to accept appointments to any COUNTRY HOSPITAL, are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	
	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	
	All Contract Practice Appointments in Western Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

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